

Physical activity and adolescent girls:
The development and evaluation of an active-gaming intervention utilising
social cognitive theory and action research

Volume I of II

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ABSTRACT

This action research study sought to develop and evaluate an SCT based active-gaming which aimed to increase physical activity (PA) behaviour and psycho-social correlates of PA in adolescent girls. A review of the literature and consultation with stakeholders led to the development of four studies. Informed by SCT the first three studies were designed to focus on the role of individual, environmental and behavioural factors on PA behaviour, respectively. Study 1 was a small-scale school-based randomised controlled trial (n=21) evaluating the effectiveness and feasibility of PA consultations on enhancing psycho-social correlates of PA and PA behaviour. Questionnaire responses, a pupil validity questionnaire and researcher case notes indicated that PA consultations were well received and effective at moving participants through the stages of change; however there were no significant changes in PA behaviour and psycho-social correlates of PA. Study 2 incorporated focus groups and inductive content analysis to identify the environmental factors that adolescent girls (n=38) perceived as influencing PA during PE. Results highlighted several key social and physical environmental factors perceived to influence PA. Study 3 employed focus groups and inductive content analysis to examine the experiences of girls (n=8) who participated in a small-scale active-gaming intervention, reporting that girls were supportive of the activity. Study 4 was informed by Studies 1 to 3 and aimed to design, implement and evaluate the effectiveness of an active-gaming intervention with group PA consultations on PA behaviour and psycho-social determinants of PA in adolescent girls (n= 244). Outcome variables were assessed by questionnaire and the feasibility and acceptability of the project was assessed by monitoring attendance, employing a social validity questionnaire and researcher case notes. Results indicated that the intervention was effective in moving participants through the stages of change; however only low active girls demonstrated significant changes in PA and psycho-social determinants of PA. The intervention was generally well received with high attendance and positive feedback. Researcher case notes indicated that less active participants responded most favourably to the intervention. Overall, the study concluded that adolescent girls' PA behaviour is influenced by individual and environmental factors. Girls are open and favourable to PA interventions, especially when they focus on the individual's needs. Active-gaming is a popular activity with adolescent girls; however active-gaming may only be effective at increasing the PA levels of low active girls.

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ACADEMIC REGISTRY
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CHAPTER 1: INTRODUCTION TO THE RESEARCH

The aim of this chapter is to highlight the key issues relating to physical activity (PA) and adolescent girls and to provide context to the overall thesis. This chapter outlines the problem of inactivity within this population and highlights some of the barriers and facilitators to PA, in order to illustrate the complexity of the issue at hand. Active-gaming as a potential medium to increase PA in this population is introduced, and the need for theory to underpin the development of active-gaming interventions is highlighted. In turn, Social Cognitive Theory (SCT) is introduced and a rationale for the development of research in this area is provided. The chapter concludes by summarising the chapters contained within the thesis.

1.1 Introduction to physical activity

PA is defined as a complex set of behaviours that encompasses any bodily movement produced by skeletal muscles that result in energy expenditure (Caspersen, Powell, & Christenson, 1985). In line with this definition, PA incorporates a wide range of activities; from every day activities, exercise, physical fitness and sport. In children and adolescents, this often includes spontaneous play, exercise, Physical Education (PE) and organised sport. It is clear that the issue of PA has great relevance to the NHS, and this has been recognised in recent policy developments, including the Health Plan for Scotland, the NHS Plan, and the National Service Frameworks for the NHS (Health Development Agency, 2005). Due to individual, social and economic costs of inactivity, it is important that efficient and urgent health improvement strategies targeting PA behaviour are developed. Further, in the Chief Medical Officer's annual report (2009), PA was described as a 'wonder drug', because the benefits of PA outweigh those of drugs or other medical treatment.

Health benefits of physical activity

Substantial evidence now exists to support the role of PA in promoting good health in children, and preventing the onset of chronic disease in adulthood (Department of Health, 2004). The health benefits of PA to adolescents include healthy growth and development of the musculoskeletal and cardiorespiratory systems, maintenance of energy balance (and avoidance of obesity and related diseases), avoidance of coronary heart disease risk factors such as hypertension and high cholesterol, and the opportunity for social interaction, achievement and improved mental well-being (Department of Health, 2004). Moreover, it is argued that children who are active in youth will remain active through to

adulthood (Fuentes, Notkola, Shemeikka, Tuoletho, & Nissinen, 2003) and are thus less likely to suffer from over 20 chronic diseases (Department of Health, 2004).

Current physical Activity guidelines for health benefits for young people

Guidance as to the amount of PA necessary to achieve health benefits is a complex and well debated issue within the field of sport and exercise science. It has been recommended by Scotland's National PA Strategy (2003) and the BASES ABC of PA for Health (O'Donovan et al., 2010) that children and young people aged 5 -16 should accumulate at least one hour of PA on all, or most, days of the week. It has been suggested that this hour does not have to be continuous but can be made up of 10-15 minute bouts of activity throughout the day (O'Donovan et al., 2010). It is proposed that any activity that causes an individual to increase their breathing and heart rate and makes them out of breath some of the time, is reaching the target of moderate activity. Activities such as walking and playing, as well as structured sports and exercise classes, are recommended.

Both BASES (O'Donovan et al., 2010) and The Department of Health (2004) suggest that in addition to achieving 60 minutes of PA on five or more days of the week, young people should take part in two or more activities a week that improve muscular strength, flexibility and bone health. Despite the availability of such information, there is still concern that these guidelines for PA in the adolescent population are too vague (Biddle, 2010). Indeed the most recent work of BASES (O'Donovan et al., 2010) has a limited focus on this population. Further, there is concern over the awareness of the public's knowledge and understanding of these guidelines. Caution regarding the lack of consideration for the dose-response relationship in PA guidelines has been given (Janssen, 2007), and particular concern has been voiced regarding the lack of significance given to emotional and psychological health outcomes during guideline development. It was proposed that in late 2010 a set of new UK guidelines incorporating the most recent evidence would be produced (PAHA, Teenage girls PA summit, 2010). It was proposed that these guidelines would be more specific and provide further clarification on the duration and intensity of PA required for healthy benefits. Indeed 2011 saw the production of new PA guidelines which have included reference to strength, flexibility, balance and intensity. Moreover, they have aligned guidance across each of the UK home countries.

1.2 The physical activity problem

Despite the well documented health benefits of physical activity, low levels of PA have become a global problem, with more than half the world's population not reaching modest PA levels (World Health Organisation, 2005). Furthermore, through several longitudinal studies, it has been shown that PA levels decline drastically during adolescence (Aarnio, Winter, Peltonen, Kujala, & Kaprio 2002; Aaron, Storti, Robertson, Kriska, & LaPorte, 2002) with a more marked decrease in girls rather than boys (Inchley, Kirby & Currie, 2008; Kimm, et al., 2002). On a local level, the Scottish Health Survey (The Scottish Government, 2010) indicated a sharp decline in PA in girls as age increased, especially in comparison to boys. Results indicated that only 41% of girls aged 13-15 achieved the recommended 60 minutes of PA on all or most days of the week. More alarming statistics indicate that for teenagers aged 11 -15, the number of Scottish girls reaching PA targets fell from 16% to 11% in 2006 to 11% in 2010 (Currie, Levin, Kirby, Currie, van der Sluijs & Inchley, 2011). In relation to age, it was reported that 16% of 11 year old, 10% of 13 year old and 8% of 15 year old girls are meeting the PA seven days a week target. Further, the report indicates that low PA and increased obesity in this population is more prevalent in Scotland than other parts of the UK and other EU countries (HBSC, 2008). In response such statistics, the Scottish Government has demonstrated a commitment to tackling the inactivity problem by developing a National PA Strategy (PA Taskforce, 2003), moreover, teenage girls have been singled out as a priority group within the five-year review of this strategy (PA Taskforce, 2008).

Significance of the adolescent girls' population

As children progress into adolescence, they go through a transition from parent managed health to personal responsibility for health behaviours. Consequently, this population requires special consideration when any health behaviour is being targeted for change. Further, adolescents form a particularly interesting area for examination, because the dramatic fall in PA this population is experiencing, is in line with dramatic physiological and cognitive changes (Niven, Fawcner, Knowles, & Henretty, 2009). During adolescence, individuals are adjusting and developing their identity, whilst reshaping their relationships with peers, family and society (Erikson, 1964). These changes are concurrent with cognitive development and formal operations (Piaget & Inhelder, 1969). Accordingly, the current thesis is underpinned by Social Cognitive Theory (SCT) (Bandura, 1986), which considers the relationship between cognitive and environmental factors and behaviour.

Economic implications of low levels of physical activity

In addition to the well documented negative physical and mental health problems associated with inactivity, there is also concern about the financial burden inactivity places on Government. It has been reported that inactivity costs the National Health Service (NHS) £1.8 Billion per year (Allender, Foster, Scarborough, & Rayner, 2007). It was estimated that in 1998, adult obesity, which is in part a consequence of physical inactivity, cost the NHS in England £0.5 Billion (National Audit Office, 2001). In Scotland, it was estimated that £85.2 Million could be saved if levels of inactivity are reduced by 1% over a five year period (Scottish Executive, 2003; British Heart Foundation, 2010). It is difficult to calculate the economic cost of physical inactivity in adolescents; however since it has been suggested that inactivity tracks into adulthood (Fuentes, Notkola, Shemeikka, Tuoletho, & Nissinen, 2003) and inactive children are unlikely to become active adults, the projected economic benefit of increasing PA levels in childhood and adolescence could be viewed as vast, and over the years, may incur economic benefit.

1.3 Variables associated with physical activity

Variations in PA behaviour cannot be attributed to a single source or variant, and as such, it is necessary to increase understanding of the different factors that can influence PA. There is debate about whether factors associated with PA should be termed ‘correlates’ or ‘determinants’, due to the mistaken inference of causality and predictability associated with both terms respectively (Biddle & Mutrie, 2008). Nonetheless, the term ‘correlates’ has more generally been accepted in the literature as fit for use (Bauman, Sallis, Dzewaltowski, & Owen, 2002) and is therefore used from this point forward.

The reasons why many adolescent girls are inactive are thought to be multi-factorial and complex in nature (Sallis, Prochaska, & Taylor, 2000). It has been proposed that in order to develop effective PA interventions, factors associated with PA need to be identified (Sallis et al., 2000). Consequently, there has been a wealth of research conducted to identify the key barriers and facilitators to PA participation within this population. An example of such a report was Sallis et al.’s (2000) review of correlates in adolescents (defined as children aged between 13-18years). This report was followed by Biddle and colleagues (Biddle, Whitehead, O’Donovan, & Nevill, 2005a), who expanded on Sallis et al.’s (2000) work on adolescents by identifying correlates central to adolescent girls’ PA behaviour. Similar work was also conducted in 2007 by NICE, who produced two

reports: one advancing on the quantitative findings (NICE, 2007a) of Biddle et al.'s (2005) and a further study which identified qualitative correlates (NICE 2007b) of PA in adolescent girls. Within Scotland, several recent reports contribute to the understanding of adolescent girls' PA behaviour; Increasing Demand for Sport and Physical Activity by Girls (Biddle, Coalter, O'Donovan, MacBeth, Nevill, & Whitehead, 2005b), The PA in Scottish School Children Study (PASS) (Inchley, Kirby, & Currie, 2008) and the reports on health behaviour in school aged children (HBSC) (Currie, Levin, & Todd, 2008). Each of these further exemplifies the complexity of the relationship between PA and adolescent girls.

1.4 Overview of correlates

Early PA research tended to attribute PA behaviour to one of three broad categories; individual factors, environmental factors or actual exercise behaviour (Dishman, Sallis & Orenstein, 1985). More recently, researchers have sought to develop these into more specific groups, and currently correlates are generally classified across four areas: physiological, considering factors such as maturation and growth; psychological, including self-efficacy (SE) and self-perceptions; socio-cultural, including factors such as social support; and ecological, which includes facilities for activity and the activity climate (Kohl & Hobbs, 1998, Sallis et al., 1992). The latest classifications are generally discussed under what is termed the ecological framework of PA, which presents correlates of PA as different 'environments'.

The key quantitative correlates identified in the NICE review (2007) and the two reports conducted by Biddle and colleagues (2005a, 2005b) are summarised in table 1.1 and discussed in relation to Scottish adolescent girls. Much of what we know about PA behaviour currently lies with the literature surrounding correlates of PA. This is important as in order to develop a PA intervention it is important to have an awareness of the factors potentially influencing PA. This is put forward by Sallis and Owen (1999) in their 'behavioural epidemiology' framework, which suggests that before interventions can be planned, we need to be conscious of the variables correlated with the behaviour. Therefore, the purpose of the following review is to highlight the factors associated with or influencing PA as detailed in Table 1.1.

Cross-sectional studies, such as those examined by Sallis et al. (2000) and Biddle (2005a, 2005b) have been integral to providing an understanding of the variables associated with

PA. However, in order to distinguish between three key areas: a) the factors that promote the uptake of PA b) those that help development and maintenance of PA and c) those that cause PA to decrease, qualitative enquiry into the motivators behind particular behavioural choices is considered necessary (Whitehead & Biddle, 2008). With this in mind, NICE (2007b) reviewed the qualitative barriers and facilitators to PA in adolescent girls, and more recently, Whitehead and Biddle (2008) investigated adolescent girls' experiences of PA. Many of the factors identified by NICE (2007b) and Whitehead and Biddle (2008) reflect those highlighted in previous reviews. However, in addition to highlighting some correlates, a deeper understanding of the role these barriers and facilitators may play in influencing behaviour is starting to emerge.

1.4.1 Demographic

As indicated earlier, age is a demographic factor influencing PA behaviour. There is substantial evidence recording the decline in PA from childhood to adolescence and this pattern is shown across much of Western society (Biddle, Cavill, & Sallis, 1998; Currie, Levin, & Todd 2006; Trost, Pate, Sallis, et al., 2002,). Biddle et al. (2005a) reported a small to moderate age-related trend of less activity for older girls across 11 studies, and Sallis et al. (2000) reported a negative association between age and PA in nearly three quarters of the 27 studies examined. The aforementioned Scottish HBSC survey (Currie et al., 2008) and the Scottish Health Survey, PASS (Inchley, Kirby, & Currie, 2008) survey, have all examined PA behaviour in adolescence. The HBSC survey (2008) reported that on a self-report measure of PA, 25% of Scottish girls age 11 were meeting the PA guidelines, but by age 13 this had decreased to 15% and again to only 9% by age 15. The Scottish Health Survey (2003) showed equally concerning statistics, reporting that 59% of 13-15 year old girls fail to reach the physical activity recommendations. In 2008, the Scottish Health Survey demonstrated that this statistic had increased with 67% of girls out with the recommended levels of PA.

It has been noted that as well as the decline in PA into adolescence, PA patterns differ according to gender, with evidence consistently showing that boys are more active than girls (Sallis et al., 2000). Biddle et al. (2005a) also reported that of the 24 studies they examined, 92% showed girls to be less active than boys. Within Scotland this relationship is also prevalent (Inchley, Currie, Todd, Akhtar, & Currie, 2004, Inchley et al., 2008,

Currie, Levin, Kirby, van der Cluijs & Inchley, 2011). These findings provide further support for adolescent girls as a priority group for PA research.

In line with aging, children progress from primary to secondary school, and the PASS findings documented that this transition may play a negative role in influencing PA behaviour, with activity levels declining across this period (Inchley, Kirby, & Currie, 2008). This information strengthens the need for research in this critical population, and indeed the examination of the role the school environment may play.

The link between socio-economic status (SES) and PA behaviour in adolescents is unclear as the evidence is mixed. Sallis et al. (2000) reported no relationship between SES and PA in adolescence. In Scotland, the PASS survey (Inchley et al., 2008) indicated that there was no relationship between self-report PA levels and SES, as reported by the Family Affluence Scale (Currie, Elton, Todd, & Platt, 1997). Similarly, Ferreira et al. (2007) indicated that, out of 9 studies, there was no association with SES and parental education for adolescents. They did however, report a positive association between PA and family income and mother's educational level. Further, Biddle et al. (2005) reported a moderately strong positive association between PA and family income in adolescent girls. However, the picture relating to parental education and PA levels was not clear. Overall, there is mixed evidence regarding SES and PA levels in adolescent girls, and as such, it is a potential avenue for important future research, but not one explored in the current thesis.

Table 1.1: Quantitative variables associated with physical activity in adolescent girls (adapted from Biddle et al., 2005a, Biddle et al., 2005b, and NICE 2007a)

Category of Variable	Correlate	Association
Demographic	Gender	-
	Socio-economic status	+
	Age	-
Biological	Body mass index	-
	Body fat	-
	Body mass	
Behavioural	Previous PA and participation in organised sports	+
	Sedentary time	-
	Smoking	-
	Healthy Diet	+
Psychological	SE	+
	Perceived Competence	+
	Self-esteem	+
	Body image/body attractiveness	+
	Enjoyment	+
	Task orientation	-
	Lack of time	-
Social and Cultural	Parental support (peer acceptance of PA, peer attitudes and peer modelling)	+
	Father's PA Participation	?
	Mother's PA Participation	?
	Parental encouragement and persuasion to be active	+
Physical Environment	Safe neighbourhood	+
	Accessible PA facilities	+
	Poor weather conditions	-

Notes: +: positive association, -: negative association, ?: association is indeterminate

1.4.2 Biological

Biological variables associated with PA, that have been examined include; body mass, body mass index (BMI), maturational status, and body fat, with the most commonly examined variable being BMI. Sallis et al. (2000) reported that findings associated with the relationship between PA and body weight and adiposity, were indeterminate. However, Biddle, Whitehead and colleagues (2005a) examined more recent studies and reported a small negative relationship between BMI and PA in 6 of 8 studies. Other studies suggest a more complex relationship between PA and biological variables. In a longitudinal study of over 200 Scottish girls, Niven and colleagues (Niven et al., 2009) reported that physical characteristics of maturation (body mass, waist circumference and sum of skin folds) were not associated with PA and the decline in PA from primary to secondary school. However, the study did report that an increase in body mass was related to lower scores on perceptions of body attractiveness and physical self-worth. These decreases in self-perception scores were found to be partially responsible for the decrease in PA over 12 months. Such findings indicate that biological variables may play mediating effects on PA behaviour in adolescent girls, and that the relationship is potentially more complex than simply cause and effect.

1.4.3 Behavioural

There are some behaviours that individuals take part in that could be related to PA. Both Biddle et al. (2005) and Sallis et al. (2000) reported on the behavioural correlates of PA in youth, and examined the possible relationship between a number of variables which included smoking, diet, alcohol use and sedentary activities. Of the 30 variables examined in Sallis et al.'s review (2000), previous PA and community sports participation were positively related to PA behaviour. Smoking had an inconsistent association in Sallis et al.'s review (2000), but when girls were examined on their own (Biddle et al., 2005a), smoking was negatively associated with PA in three of four studies. Biddle et al. (2005a) also reported a moderate-to-large strength of association between PA behaviour and competitive sports participation.

Sedentary behaviour, whereby an individual is not active (such as TV viewing and desk work), was negatively associated with PA in one study presented by Sallis et al. (2000). In recent years, sedentary activity has become a growing area in PA research, as in part, it is commonly assumed that sedentary activity may replace PA in youth and thus be largely responsible for the decline in PA in this population. A meta-analysis of studies examining

the use of computer games, TV viewing and PA, reported just a small negative association between PA and TV viewing. Biddle et al.'s (2005b) study reported that whilst there was no overall relationship between time spent watching TV and time spent being physically active, girls who reported watching TV for more than four hours a day during the week, conducted only close to 25% of their time participating in sport and PA than those girls who watched under 2 hours. Nonetheless, there is evidence to suggest that TV viewing as a sedentary pursuit is an inadequate explanation for inactive lifestyles (Biddle, Gorely, & Stensel, 2004).

Perhaps of more interest is the negative association between girls' perceptions of lack of time and PA (Biddle & Whitehead, 2008). The emergence in recent years of social networking sites and instant messaging services, such as Facebook, Bebo and MSN, may also be competing behaviours for girls time (Biddle et al., 2005). This is in combination with part-time jobs, social events and homework, all of which have been posited as potential rivals to PA for girls' time (Biddle et al., 2005b, Whitehead & Biddle, 2008).

1.4.4 Individual

In general, individual correlates of PA are referred to as psychological correlates, or intrapersonal influences on PA behaviour (Biddle & Mutrie, 2008). The aforementioned key systematic reviews (Biddle, Whitehead et al., 2005; Sallis, Prochaska, & Taylor, 2000) focused on key variables associated with PA and adolescent girls. Important individual variables were identified as enjoyment, self-esteem, perceived competence, body image and attractiveness and self-efficacy (SE). To provide a detailed review of each of these variables is out-with the scope of the current thesis, but an awareness of their potential influence on PA is important and thus they are summarised below.

Enjoyment

Sallis and colleagues (2000) reported that enjoyment was unrelated to PA in the five studies they reviewed. However, Biddle et al. (2005a) reported that seven of eight studies demonstrated a positive relationship between PA and enjoyment, with small to moderate effects. In a focus group study examining adolescent girls' perceptions of PA (Whitehead & Biddle, 2008), enjoyment emerged as a common theme. It was highlighted that enjoyment appeared to be the most important factor in determining how active girls chose to be. Similar findings were also reported by Dishman and colleagues (Dishman et al., 2005) who, in their randomised controlled trial, reported a link between increased

enjoyment and increased PA in adolescent girls. The PASS (2008) reported that in PE, girls reporting that they enjoy PE ‘a lot’ dropped from 63.1% in Primary Seven, to less than half that (31.7%) in fourth year of secondary school. This is suggestive of a link between enjoyment and PA, given the reported decline in PA participation in this same population. Further, also within Scotland, Biddle and colleagues (2005b) reported that 73% of girls reported enjoyment as the main reason for participation in PA and sport. This study also reported that girls who took part in PA for enjoyment, in contrast to those who participated to change their body image, were less likely to feel self-conscious about participating.

Self Esteem

Biddle et al.’s (2005) reported that the measure of global self-esteem was unrelated to PA across all 6 studies included in the review. It is suggested in the report that the multi-dimensional hierarchical model of self-esteem (Fox, 1997) may provide an explanation for the findings. The model suggests that self-esteem is influenced by a number of sub domains (i.e. our social self-versus our physical self) and that further sub domains within these areas exist. In relation to physical activity, the physical self is thought to be made up of the sub domains; physical fitness, sports competence, physical appearance and attractiveness. It is proposed that each of these components influence global self-esteem over time. Moreover, it is suggested that global self-esteem will not be as strongly associated with PA as domains of the physical self; something which was supported in Biddle et al.’s (2005) review.

Perceived competence

In Sallis et al.’s (2000) review, perceived competence was reported as having a consistent and positive association with PA. Similarly, perceived competence was associated with PA in four of five studies examined in Biddle et al.’s review, with most effects reported as small. PASS (2008) reported a significant association between perceived competence and PA, with those reporting low perceived competence being the least active across all years, from Primary Seven to Fourth Year. In general, it was reported that a number of pupils felt that when given a choice of PA, they were most likely to take part in those that they were good at. In Biddle et al.’s (2005b) Scottish report, 35% of girls believed that they were not good at sport and there was a small negative relationship between girls perceptions of their competence and their participation in PA.

Body image and attractiveness

Sallis et al. (2000) reported the relationship between body image PA was categorised as an indeterminate correlate. However, Biddle et al. (2005) reported a consistent association between PA and body attractiveness and physical self-worth, and reported a small to moderate positive association between importance of body weight and appearance, and PA. In the PASS report (2008), whilst the number of girls reporting that they were ‘too fat’ increased in line with year group, there was no association between body image and PA. However, the qualitative component of this study highlighted that body image was a concern related to PA for a number of pupils. A similar finding was presented by Whitehead and Biddle (2008), who reported that self-presentational concerns in relation to PA were an issue for some participants, for example pupils reported feeling uncomfortable in a swimming costume and so avoided swimming. Whitehead and Biddle (2008) also highlighted weight concerns of participants to be influential in their PA choices and experiences.

Self-Efficacy

SE in relation to PA can be defined as; ‘the belief in one’s ability to be physically active’ (Ryan & Dzewaltowski, 2002). SE was reported as inconsistently associated with PA in adolescents (Sallis et al., 2000). However, in contrast, in their review of 10 studies Biddle et al. (2005a) reported a positive association between PA and SE in teenage girls. Additional research supporting a positive relationship between teenage girls SE and PA has come from a number of other studies (Loucaides, Plotnkioff, & Bercvitz, 2007; Trost, Pate, Ward, Saunders, & Riner, 1999). The relationship between SE and PA is discussed in more detail in future chapters.

1.4.5 Environmental

Environmental correlates associated with PA are generally assigned to the physical environment and social environment. The physical environment has been defined as the space outside the person (Sallis & Owen, 2002). The physical environment can include factors such as the weather, sports facilities, access to green space, and availability of sports equipment.

The social environment generally refers to the people involved within an environment, and the majority of research in this area was focused on social support. Social support from parents has been reported to be positively associated with PA in adolescents (Sallis

et al., 2000) and family support (including parental support) was also shown to be positively correlated to PA in Biddle et al.'s report (2005a). Chapter 5 provides an in-depth overview of the role of the environment on PA behaviour in teenage girls.

It was reported in one review that there was an indeterminate association between peer support and PA (Biddle et al., 2005a). Similarly, peer modelling of PA and perceived support from peers was detailed as indeterminate in Sallis et al.'s review (2000). Nonetheless, Biddle et al. (2005b) reported that 81% of Scottish schoolgirls reported a preference for having a friend with them when being active. The PASS (2008) report indicated that in younger adolescent girls, peer social support was not associated with PA, however as girls got older a significant interaction was observed, with the low peer support group being less active. The PASS (2008) report also reported a relationship between peer socialising and PA and reported no significant association in older adolescent girls. Their findings suggest that as girls get older, they are more likely to be spending time with their peers in non-active activities or interests. Further investigation into the relationship between friendship groups, and peer influence on PA is encouraged (Biddle, Whitehead et al., 2005).

This overview has highlighted that correlates of PA in adolescent girls fall across a variety of categories. Consequently, understanding and influencing changes in PA behaviour in this population is complex and low levels of PA in adolescent girls have been identified as a public health concern. This rise in inactivity has coincided with a number of technological advances and it has been suggested that new technology may offer a means to promote PA and to target some the aforementioned correlates of PA. To date, research in this area is limited and developing our understanding of the potential of this medium has been identified as important (Biddle, 2010)

1.5 Technology and physical activity

In the last fifteen years there have been progressions in a number of areas that may have relevance to PA. These include mobile phone technology, the World Wide Web, digital music (e.g., MP3 players) and a number of interactive computer games (often referred to as active-gaming). Active-gaming or exergaming (a portmanteau of "exercise" and "gaming") refer to computer consoles which have controllers that require body movement in order to play the games. The terms exergaming and active-gaming are used

interchangeably in the literature. Active-gaming has been defined as: “Active-gaming combines the use of technology in the form of a game with physical activity” (Hansen, 2007). Two of the most popular of these active-gaming programs are Konami’s Dance Dance Revolution (DDR) and Nintendo’s Wii. DDR involves gamers dancing their way to victory through the use of a dance pad and has a calorie burner and workout routine. The Wii, which incorporates motion sensors, allows players to simulate a variety of physical activities e.g., golf, tennis, baseball and dance.

The Nintendo Wii, Sony Eye toy, Konami DDR and other speciality exercise simulators have all proved successful in the economic market (Smith, 2007). Each device has illustrated the infiltration of computer games into domains of PA and games are becoming an ever present part of society and lifestyles (Smith, 2007). Moreover, computer games in general have now become an established form of entertainment for children and adolescents (Durkin and Barber, 2002), which are widely available, accessible and utilised as a leisure activity (Gentile and Walsh, 2002). In a UK based project it was reported that 91% of children played three or more forms of gaming and of these, video console games were the preferred choice. In the 11-16 year old group, 74% played 3-7 times a week with an average session lasting 1.9 hours (Pratchett, 2005). Such evidence provides support for the utilisation of gaming as a means to target the notoriously hard-to-reach population; adolescent girls.

To date, much psychological research in relation to gaming has focussed on the possible negative role of computer games, particularly in relation to aggression (Colwell, 2007). In more recent years the focus on computer game use has moved to establishing reasons for play and the positive role that computers may play in cognitive development and socialisation roles (Willoughby, 2008). Further, in relation to PA, video gaming has historically been linked to sedentary lifestyles (Inchley & Currie, 2005, Palmerira, Martines, Fonesca et al, 2008, Maddison, Foley, Mhurchu et al, 2009). However, new proposals have suggested that advances in technology could be used to promote PA (Unnithan, Houser & Fernhall, 2006, Bogost, 2005) and a review of this research now follows.

1.5.1 Summary of anecdotal evidence

Overall, anecdotal evidence is supportive of active-gaming as a means of promoting PA in adolescents. In reported trials in the UK and the USA, participation levels in active-gaming have been high, and it has been viewed by promoters as an effective way to introduce people to exercise. A supporter of active-gaming has highlighted this as one of the main attributes of active-gaming: *“There is no segregation on ability. Even if they know they can’t do all of it, they can try anyway. And it’s a good way of introducing them to the gym.”* (Cardwell, 2007.). The inclusive nature of active-gaming is thought to be a positive feature of the activity. This is supported by other reviews which suggest that people of all abilities feel comfortable participating in DDR (Cardwell, 2007, Hansen, 2007). In relation to attitudinal responses to active-gaming, it has been suggested that after an extended period of exposure to DDR, participants showed a marked improvement in their attitude, displaying a new confidence and a desire to maintain their new skills (www.gamasutra.com). It is worth noting that in situations where DDR has been seemingly successfully employed in schools, it has been used to complement the current PE curriculum, rather than as a standalone component. (Gach, 2007) and this is perhaps why it has, in this case, had seemingly positive results. It has been identified that choice may provide an important role in motivating people to exercise (Hohepa et al., 2006, and Smith et al., 2009) and offering DDR as an exercise option increases choice. Fry and Koller (2007) believe that in order to be successful, DDR must not be a “one shot wonder” and must help people to get fit and be an effective tool for years to come. However, such suggestions have no sound scientific backing, and consequently, further examination is necessary.

In addition to magazine, TV and newspaper articles, the primary researcher of this thesis carried out steering group meetings with key stakeholders throughout the duration of the project. The steering group was an important feature of the action research perspective of the study. Learning and Teaching Scotland (LTS) had a representative on this group who provided evidence in support of the promotion of computer game use in the classroom. Whilst the majority of LTS’s evidence was anecdotal and was concerned with the teaching of mathematics, literacy and technology, LTS supported the use of active-gaming in the promotion of PA in PE. LTS felt that, in this instance, technology could be used to supplement existing teaching, and could be effective in engaging hard-to-reach populations. Further, LTS felt it was important to ensure that school is an environment in which children wished to be. They also felt that education systems need to reflect

experiences children have out of school and within a domain that children have level of ownership, mastery and expertise in (Robertson, 2009), something they propose the introduction of technology can achieve.

1.5.2 Current Active-Gaming Research

A review of the literature identified that there were considerably more papers that assessed the physiological effects of active-gaming than any other area (i.e. psychological, sociological) and varying results in this domain were reported. In a study that compared using the Eyetoy, DDR and walking whilst watching TV, the DDR intervention was shown to have the greatest effects on energy expenditure (Lanningham-Forster, Jensen & Forster, 2006). Similar results were found by researchers at Heriot Watt University (Thin, Howey, Murdoch & Crozier, 2007), in which they found that physical exertion in an Eyetoy game gave noteworthy results in relation to energy expended. Further, Maddison et al (2009) also reported that energy expenditure was greater when playing active video games (Sony eye toy) than sedentary video games or rest. Results in other studies indicate that there are potential positive effects of active-gaming on a variety of physiological functions; however the intensity and duration of exposure needs to be clarified to ensure optimal results for health (Maddison, et al., 2007, Tan, Ariz, & Chua, 2002).

An additional study examining energy expenditure in adolescents when playing new generation and sedentary computer games has indicated that whilst new generation gaming expends more energy than sedentary gaming, the level of energy expended is not as much as when the participant took part in authentic sports (Graves, Stratton, Ridgers & Cable, 2007). Further, Graves et al. suggest that the level of energy expenditure is not enough to contribute to the recommended daily levels for children. Nonetheless, they highlight that given the rising obesity problems, it is possible that it is more beneficial to have children on their feet, moving in all directions, whilst performing basic motor control, than not moving at all and consequently, such behaviour should be encouraged. This finding could suggest that although active-gaming may not be as beneficial as carrying out the sport or activity itself it may provide an introduction to the activity and in turn may encourage individuals to try something they may not otherwise have done.

The reasons as to why children participate in active-games are of interest and accordingly, Liberman (2006) investigated the reasons for DDR participation in children. It was suggested that 'having fun' was the main reason people played DDR. Further, it was

reported that enjoyment levels were highest for those who reported playing the game to stay fit. An international survey on DDR indicated that most people are motivated to play DDR for entertainment and enjoyment (Hoyseneiemi, 2006). This is supported by the findings of a dissertation which showed participants enjoyed exercising using DDR more than using a treadmill (Leininger, 2007). Mokka, Vaatanen, Heinilla and Valkkynen (2003), investigated the effects of taking part in a 3D simulated cycle. Participants followed a simulated cycle route and reported that they felt like they were actually in the environment. The researchers suggested that exercising in this manner was “captivating” and “motivating”. Overall, papers with a psychological component mainly assessed enjoyment levels of, and reasons for, active-gaming.

Until recently, there have been no peer review studies that have examined the psychological impact of active-gaming or the consequent impact this had on PA. However, in 2010 Cummings and Duncan, examined changes in affect and future exercise intentions as a result of exposure to a regular exercise programme using the Wii Fit (Cummings and Duncan, 2010). Seven sedentary women took part in an exercise programme which utilised the Wii Fit for eight sessions. The study examined a number of measures to examine affect as well as qualitative enquiry into participant experiences of the programme. The study found diverse patterns of affect during Wii Fit sessions. Qualitative analysis highlighted both positive and negative feedback about the programme and the Wii Fit as a means for increasing PA. At follow up only two of seven participants had maintained exercise behaviour.

Whilst the study is to be applauded for examining a relatively new research area, there were a number of methodological limitations; the duration of the programme was different per exerciser (three weeks to five weeks) and it took place in different environments (some at home and some in a lab setting), further, there were small participant numbers. Additionally, there was no monitoring of what type of activity participants were taking part in (there are eight modes of activity in Wii Fit sessions). This could have accounted for the varying levels of affect depending on what activity participants were taking part in. Finally, inter-rater reliability was not checked in the qualitative analysis. Despite these limitations, Cummings and Duncan (2010) acknowledge that the provision of a Wii Fit exercise programme with no additional support was not effective in increasing PA. They suggest future interventions could provide psychological support to supplement Wii sessions.

Additional research examining adherence to active-gaming exercise programmes was conducted by Mdsen, Yen, Wlasuik and Newman (2007). They carried out an investigation in which overweight children used DDR for 30 minutes, 5 days a week. Participants kept a diary and a memory card was used to record their energy expenditure. Researchers used telephone interviews to encourage participation, and to assess enjoyment. It was reported that a number of stressors impinged upon adherence to the program and consideration of these stressors in future PA research is encouraged. Whilst DDR was not associated with a change in BMI or baseline after 3 or 6 months, the researchers put forward an important suggestion that in order to be successful, a DDR intervention would do well to use children's suggestions to add group participation, competitions and peer or family support.

Also examining the feasibility of an active-gaming intervention, Maddison et al. (2009), carried out a feasibility study into the design and conduct of an active-gaming study for 10-14 year olds. Whilst Maddison et al's study was a larger scale study than that of the current thesis, it provided several points of interest for the development of an active-gaming intervention: The study underlined the importance of a pilot study in an area which is in its infancy in terms of research. It also provided useful advice for the delivery of an active-gaming intervention and particular points of note were procedural issues, working with schools, and measurement scales employed by the research team. Each of these is given consideration in the development phase of the intervention presented in Chapter 7. Accordingly, this provides a rationale for Chapter 6 to be used as a pilot for the final study presented in Chapter 7 of the current thesis.

Additional research, which provides important consideration for the development of an active-gaming intervention, comes from Dixon, Maddison, Mhurchu et al. (2010), who examined the perceptions associated with active-gaming and the consequent facilitators and barriers to sustained engagement. Focus group research with parents and children, found that on the whole, there was support for active-gaming, but there were barriers and concerns alongside this support. Parents were concerned that active-gaming was carried out at the expense of outdoor play, and that the cost of active-gaming, and the physical space the consoles require, could be barriers. In general, all participants felt that active-gaming provided an opportunity to increase activity, improve fitness, and change body shape. Further, pupils found the activity enjoyable. For children, there were different opinions across genders. Girls felt that active-gaming could help them to lose weight,

whereas boys felt that they could increase their size and strength through gaming. Interestingly, the children did not think they would engage in active-gaming into adolescence, and girls felt that active-gaming was more suitable for boys. The study highlighted that given the importance of peers to adolescents, participation through group involvement may be a means of promoting the activity in this population in the future.

Also worthy of consideration for intervention development, is Foley and Maddison's (2010) review of the role active-gaming can play in increasing PA. They reviewed several of the aforementioned papers and included more recent publications. Of the studies included in the review, eight made reference to the psychological consequences of active-gaming, although there were no studies that explicitly examined this area. In line with the current literature review, the remaining studies had a physiological focus and support the summarised findings provided above. Foley and Maddison (2010) reported that compared to traditional exercise, active-gaming led to greater energy expenditure which was comparable in intensity to mild to moderate intensity PA. Further, they highlighted that there may be a role for active-gaming to increase free-living PA and improve body composition in children. Foley and Maddison support the need for more empirical, methodologically sound investigation into the active-gaming in order to provide more authoritative guidance on the use of active-gaming as a long term behaviour change tool.

1.6 Future active gaming research and the use of theory

The literature summary highlights that active-gaming research, in relation to PA and psycho-social correlates of PA, is in its infancy. Early reports suggest there are physiological benefits of active-gaming, some of which are dependent on the console and game being used. Findings have suggested that exergaming can provide the means of achieving the recommended levels of activity, whilst others highlight that, although exergaming is a means of getting people physically active, it is unlikely for a simulated form of exercise to be as beneficial as the authentic activity. Anecdotal evidence and general reviews suggest that exergaming is popular because it is enjoyable, and individuals feel comfortable when participating, regardless of ability. Both enjoyment and 'fun' have been highlighted as possible motivators for participation in active-gaming, but more advanced investigation into the psychological and long term benefits of active-gaming are limited. It is apparent that there are gaps in the literature, and there is room to increase the scientific rigour of research examining the impact of active-gaming on a

number of variables. Moreover, to date, the use of a theoretical basis to consider behaviour change has only been used in one active-gaming study (Cummings and Duncan, 2010). In accordance with this, the current thesis aims to adopt a strong theoretical basis for the active gaming intervention by using SCT. In employing SCT, it is anticipated that the potential influence of this novel activity on psycho-social and environmental correlates of PA and PA behaviour, in traditionally hard-to-reach populations can be investigated.

It has been suggested that theory plays a vital role in health education (DeBarr, 2004) and the Health Education Profession in the 21st Century: Progress Report 1995-2001 highlighted that: “Dynamic and Quality practice applies state-of-the-art theory and technology in the design, implementation and evaluation of health education programmes” (2001, p. 44). In relation to PA and adolescents, it has been recognised that there is no standalone theory or definitive guide as to how increasing PA should be achieved (Nahas, Goldfine & Collins, 2003).

There have however been a number of theories proposed for enhancing PA in adolescents, one of which is SCT. Bandura’s SCT (1986) proposes that correlates are classified across three categories: personal, environmental and behavioural and that each of these factors interacts in a reciprocal fashion to determine behaviour and behaviour change. SE is considered the key construct in the theory (Bandura, 1986). The current chapter identified correlates of PA across four broad spectrums: physiological, psychological, socio-cultural and ecological. It may be suggested that the recent classifications allocate physiological and psychological correlates to the personal component of the SCT framework, whereas social, cultural and ecological correlates can be classified under the environmental component, and PA is the key behaviour of interest. The natural link between SCT and the correlates identified as central to PA promotion, suggests SCT as a suitable theory on which to base PA interventions. Other considerable research examining the relationship between variables associated with PA have indicated that correlates are interactive and multi-dimensional as well as being assigned to each of the factors highlighted as central to SCT (Dunton, Janner, & Cooper, 2003; Motl, Dishman, Ward et al., 2002; Saunders, Motl, Dowda, Dishman, & Pate, 2004).

SCT has also been proposed as a useful theoretical framework to understand exercise behaviour because of its influence on choice, effort, persistence, and affective aspects of

behaviour (McAuley & Blissmer, 2000). Accordingly, SCT has been used to understand behavioural patterns in children and adolescents (Strauss, Rodzilsky, Burak & Colin, 2001). Further, SCT has been recognised as an effective framework for informing PA interventions (Glanz et al, 1997, McAuley, 1992, Nahas et al., 2003) and The Surgeon General has recommended SCT as a framework for organising, understanding and promoting PA (USDHHS, 1996).

1.7 Purpose and significance of the research

PA behaviour in the adolescent girl population is a concern and the correlates associated with low levels of PA are complex and multiple. Increasing PA in this population is a priority and active-gaming may offer an attractive PA option for adolescent girls. The aim of this thesis is to use SCT to develop an active-gaming intervention and subsequently evaluate the effectiveness of the intervention on correlates associated with PA and actual PA behaviour in adolescent girls.

From the results of this study, recommendations will be made for over-coming barriers and developing facilitators to PA, with the aim of increasing activity levels in this critical population. It is expected that these recommendations will support NHS Health Scotland and Scottish Executive initiatives on PA within the Healthy Living framework, Health Promoting Schools Unit, the Curriculum for Excellence and Sportscotland's 'Active Schools' programme.

1.8 Summary of Chapters

The overall purpose of this thesis was to develop and evaluate the effectiveness of an active-gaming intervention, utilising social cognitive theory (SCT) to increase PA and psycho-social variables, associated with PA in adolescent girls. In order to achieve this purpose the thesis has been presented as eight chapters.

Chapter 1 aimed to introduce the problem of low level PA in adolescent girls. The concept of active gaming was introduced as a potentially novel way to engage adolescent girls and the importance of theory in informing interventions was noted. Accordingly SCT was introduced as an appropriate theory on which to base an active-gaming intervention for adolescent girls.

Chapter 2 examines the development of SCT and introduces health promotion by social cognitive means as an effective tool for examining PA behaviour in the population of interest and the development of the current thesis. It was noted that there was a need to consider how each of the components of SCT is relevant to the specific population of adolescent girls.

Chapter 3 considers the methodology employed in the current thesis. The overall methodology underpinning the thesis was action research whereby the researcher adopted an integrated role and, at times, acted as a practitioner. Chapter 3 outlines the nature of action research and justifies why it is an appropriate approach for the current thesis. Additionally throughout the thesis, a mixed-methods approach was employed, in which both qualitative and quantitative methods were used, thus Chapter 3 also discusses this approach.

Informed by SCT, the first three studies (Chapters, 4, 5 and 6) were designed to focus on the role of individual, environmental and behavioural factors on PA behaviour in the population of adolescent girls so that the findings could be used to inform the final intervention. Chapter 4 presents Study 1 which focused on the personal factors related to PA behavior, and the aim of the study was to evaluate the effectiveness of a PA consultation intervention on personal correlates of PA and PA behaviour with adolescent girls aged 13-16 (S3; n=21). Additionally, the study aimed to assess the feasibility of the intervention, through a social validity questionnaire and researcher case notes.

Chapter 5 presents, Study 2 which focused on environmental factors related to PA behaviour. The aim of the study was to employ focus groups with adolescent girls (n=38) and inductive content analysis, to identify the social and physical environmental factors that adolescent girls felt were important to being physically active in school PE.

Chapter 6 presents Study 3 which focused on the behavioural component of SCT and aimed to examine the experiences of participants who took part in a six-week active-gaming intervention using Dance Dance Revolution software

Chapter 7 presents Study 4 which was based on the findings of the previous studies. The main aim was to develop and evaluate the effectiveness of an active-gaming intervention,

underpinned by SCT, on PA behaviour and psycho-social determinants of PA, in a Scottish secondary school.

Chapter 8 highlights the contributions the thesis has made to the literature by discussing key conclusions and practical recommendations as well as identifying future research directions.

1.9 Conclusion

This chapter outlined the problem of PA in Scottish adolescent girls. It highlighted the key correlates associated with PA in this population and detailed the purpose and significance of the research. Finally, the organisation of this thesis was outlined and the purpose of each of the chapters summarised.

CHAPTER 2: SOCIAL COGNITIVE THEORY

Chapter 1 highlighted that PA can be influenced by a variety of variables and that it is important that the development of behavioural interventions is underpinned by theory. Accordingly, SCT was introduced as a suitable theory to underpin the current thesis. The aim of this chapter is to 1) outline the development of SCT 2) discuss the key tenets of SCT in relation to PA 3) discuss the importance of SE and Self Efficacy theory (SET) within this framework and 4) outline the practical application of SCT.

2.1 Development of Social Cognitive Theory

In order to understand the development of SCT, it is important to highlight its origination. Bandura's early work stemmed from a behaviourist stance which was then developed into social learning theory (Pajares, 2002). The prominent behaviourist, Skinner, proposed that, aside from genetics, human behaviour was shaped solely by the environment. He believed that *"a person does not act upon the world, the world acts upon him"* (Skinner, 1971, p. 211). In essence, behaviourists argue that behaviour is the sum of learned behaviours. Behaviourists highlighted the input of stimuli from the environment and the output of behavioural responses to these stimuli. Social learning theorists argued that social experience is a crucial determinant of human behaviour. Much like behaviourism, social learning involves both operant and classical conditioning, but also involves processes of imitation and identification acquired through social experience (Hayes, 2000).

The behaviourists dominated much of the early psychological research; however the notion that the environment alone was responsible for an individual's behaviour was challenged as early as the 1920's and particularly with the development of Millar and Dollard's theory of social learning and imitation (1941). However, their theory failed to take into account some of the complexities of human behaviour, and in the 1960's, Bandura and Walters published *Social Learning and Personality Development* (1963). Whilst Bandura's early work was based on early behaviourism, it progressed to include some concepts of cognitive theories. A further important breakthrough for Bandura came in 1977, when he identified self-belief as an important function in his social learning theory, in his development of SET. Then, in 1986 came the development of what is now known as SCT. SCT was developed because the behaviourist view of ignoring the role of inner processes was thought to be too simplistic an approach, as it did not account for the

complexities of human functioning and behaviour (Bandura, 1997). The term ‘cognitive’ was used in order to highlight the role of cognitions in everyday lives and Bandura stressed that humans are cognitive beings; humans actively process information and are likely to think about the relationships between their behaviour and its consequences (Bandura, 1989).

2.2 Components of Social Cognitive Theory

SCT views human behaviour as the result of a triadic, dynamic and reciprocal interaction of three factors: personal, behavioural and the environmental (Bandura, 1986). Figure 2.1 illustrates the interaction between these three factors. It is proposed that behaviour is initiated and maintained through complex interactions of each of these environmental, personal and behavioural factors. Whilst the term “reciprocal” is utilised by Bandura, he does not suggest that each of the determinants are of equal strength, but rather, that in any given opportunity there is room for their influence to vary dependent on circumstance.

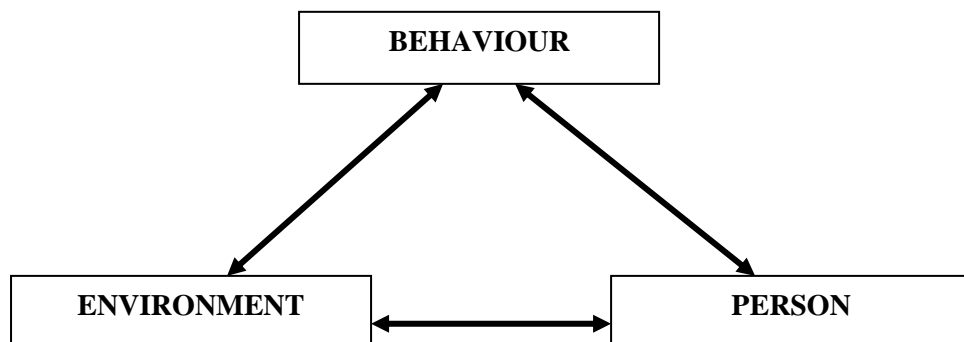


Figure 2.1: Model of the triadic reciprocal interaction of Social Cognitive Theory (adapted from Bandura, 1997)

Figure 2.1 illustrates that the person-behaviour interaction refers to the bidirectional influences that one’s thoughts, emotions and biological properties have on one’s actions (Bandura, 1986). There is also a bidirectional interaction between the environment and personal characteristics, whereby human expectations, beliefs and cognitive competencies, are manipulated by both social and physical environmental factors (Bandura, 1986). Within the model of SCT, social influences can influence behaviour through factors such as modelling, instruction and social persuasion. The final bidirectional interaction is between behavioural and environmental factors. Bandura (1986) postulates that individuals are both a product and producer of their environment and this suggests that behaviour influences the environments one is exposed to and in

turn, one's behaviour can be adapted by that environment. The reciprocal nature of SCT means that where an intervention seeks to change behaviour, it can target personal, environmental or behavioural factors (Pajares, 2002). Further, these factors do not develop simultaneously; one may be more effectual before the others and vice versa. It is important to reiterate that the SCT model proposes a causal triadic relationship between the environment, the individual and behaviour and as such all correlates of PA are assumed to be interactive and interrelated. In essence, SCT proposes that the PA behaviour must be examined as a dynamic reciprocal interacting causal system (Dzewaltowski, 1994).

2.3 Health promotion using Social Cognitive Theory

In 2002, Bandura developed a model of health promotion through social cognitive means. SCT highlights core determinants and the ways in which these determinants work and are converted into health practices. The model provides a medium for applying SCT as appropriate and this model is used as a guide for practical application of SCT in the current thesis. The core determinants outlined in the model include knowledge of health risks and benefits, SE in relation to exerting control over health behaviours, outcome expectations related to the pros and cons of health behaviours, goals related to health behaviour and the strategies adopted for achieving these goals and the perceived facilitators and impediments to a healthy lifestyle (Bandura, 2004).

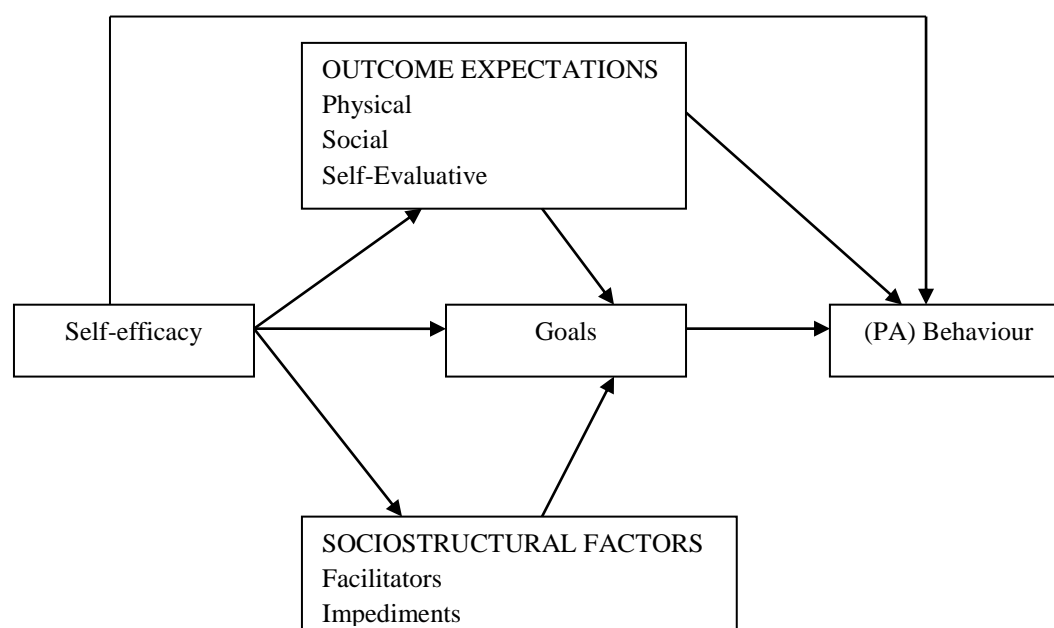


Figure 2.2: Paths of influence in Social Cognitive Theory: Causal model of health promotion highlighting self-efficacy as a direct and indirect influence on behaviour (adapted from Bandura, 2002 and 2004)

Figure 2.2 illustrates the 'paths of influence' in Bandura's social cognitive model of health promotion. The model does not illustrate the social cognitive determinant of knowledge, but Bandura (2004) has highlighted that this is necessary for change to occur; if people are ignorant to the consequences of behaviour choices on health and wellbeing, they are unlikely to have the will to change unhealthy behavioural choices they enjoy. However, knowledge alone does not influence behaviour change and the model illustrates a multi-faceted structure in which SE combines with goals, outcome expectations and perceived environmental impediments and facilitators to influence human motivation, behaviour and wellbeing (Bandura, 2004). It is proposed that SE is at the core of this model, as SE is thought to influence the central processes associated with personal change. Bandura outlines these processes as; consideration of behaviour change, initiating the change, persevering with change, being capable of maintaining change in the face of adversity and long term maintenance of behaviour change (Bandura, 2004). Further, Bandura suggests that SE is central to health promotion because of its influence both directly and indirectly on the aforementioned additional determinants of health promotion.

Of these determinants, outcome expectations are thought to determine behaviour choices, as unless an individual is motivated by the outcomes they anticipate from behaviour change, then they are unlikely to achieve this change. Bandura suggests that outcomes fall across three main categories: physical outcomes, social approval and disapproval and positive and negative self-evaluative reactions. SE is thought to influence these expectations with those high in SE expecting positive outcomes and those low in SE anticipating a negative outcome. Goals are thought to influence health promotion through providing incentives and guides to implementing healthy behaviour change. Bandura suggests that those with higher SE will set themselves higher goals and show more commitment to these goals than those low in SE. Finally, Bandura proposes that change would be relatively straightforward if there were no barriers to this change and more difficult without facilitators. Individuals low in SE are easily overawed by impediments and will give up more easily than their counterparts who are high in SE. These individuals perceive barriers to be overcome through improving their self-management and effort.

From examination of the SCT and PA literature, it seems appropriate to use Bandura's (2002) model as a basis for both understanding health behaviour, but also for developing intervention programmes to enhance this behaviour. The model advocated by Bandura for

the promotion of health has been adapted somewhat by researchers and more specific variables within these general aspects have been examined (Anderson, Wojick, Winett, & Williams, 2006; Dishman, et al., 2004; Petosa, Hartz, Cardina, & Suminski, 2005). In all three studies, some of the social-cognitive factors could explain the variance in PA levels. It would be extremely difficult to examine every sub-process of the main themes in detail and it is certainly out with the scope of the current thesis. However, using this generic framework combined with relevant literature, highlighting the specific correlates of PA appears to be a solid foundation for the development, implementation and evaluation of intervention programmes. PA interventions are reviewed in chapters 4, 5 and 7.

2.4 Personal factors

The construct of SCT and Bandura's term 'agency' suggests that we are not reactive organisms, but we have the ability to have an impact upon our environment and behaviour (Bandura, 1998). Personal agency refers to; 'ones capabilities to originate and direct actions for given purposes' (Zimmerman and Cleary 2006) and it is proposed that agency is influenced by SE. Within the causal system SCT highlights the importance of cognitive processes and that an individual's cognitive functioning is a means for individuals to control other PA determinants (personal, environmental and behavioural) (Dzewaltowski, 1994). Within SCT, it is proposed that there are three primary cognitive processes thought to influence PA; SE expectations, goals and outcome expectations (Rejeski, 1992).

2.4.1 Self-Efficacy

Numerous psychological variables associated with PA have been proposed, but it has been suggested that SE is one of the strongest correlates of PA (Biddle et al., 2005) SE is a cognitive function contained within the personal component of SCT and Bandura (1986, p. 391) defined perceived SE as:

People's judgements of their capabilities to organise and execute courses of action required to attain designated types of performances. It is concerned not with the skills one has but with judgements of what one can do with whatever skills one possesses.

Bandura identified SE as the main component of SCT (Bandura, 2004) as it is thought to have both a direct and indirect influence on other determinants and is vital for individuals to be agents in their own behaviours (Bandura, 1997). SET was developed by Bandura in order to provide deeper understanding of human behaviour. SE is often mistaken for self-belief or confidence but differs from these concepts as it is directly related to the resources an individual has and has a more specific focus.

SET proposes that unless humans believe that their actions will produce desired outcomes, then they have little reason to act or to maintain action in the face of adversity. As such, it is thought that SE beliefs are the foundation of human motivation, wellbeing and accomplishment. Bandura highlights that human behaviour can often be predicted by what individuals believe their capabilities are, rather than what they are actually capable of achieving. Specifically, Bandura (1997) states *“People’s level of motivation, affective states, and actions are based more on what they believe than what is objectively true.”* (Bandura, 1997, p. 2). Consequently, SE can often explain why humans behave in different ways and why their behaviour is not always matched to their capabilities. Explained further, an individual who has the necessary resources to carry out a task, but does not have the belief that they can, is not likely to succeed, in fact they are likely to avoid becoming involved in the task at all.

Bandura (2005) proposes that efficacy beliefs are central to change-initiation, adoption and maintenance in motivating and regulating health habits. It is proposed that SE influences behaviour through a number of processes and can be seen as both a determinant and outcome of PA, as well as influencing the adherence to an intervention programme (McAuley & Blissmer, 2002). He suggests that these beliefs also influence whether or not an individual challenges and considers changing unhealthy habits, and proposes that individuals are unlikely to try to be healthy if they do not believe they have the ability to succeed. In smoking behaviour, it has been shown that those with higher SE at the beginning of a smoking cessation programme are more likely to succeed with giving up smoking than those with lower SE at this same stage (DiClemente, 1981). Bandura suggests this is because higher SE provides staying power in the face of adversity and difficulty, often known as self-regulatory SE.

Nature and dimensions of Self Efficacy

SE aids in the development of new skills and behaviours through increasing attention, motivation and decreasing negative effect, such as anxiety (Zimmerman, 1995). Since this definition, SE has developed to incorporate the role that cognitive processes play in achieving behaviour. Accordingly, two forms of SE have emerged: task SE and barrier SE (McAuley & Mihalko, 1998). Task SE refers to an individual's belief that they can actually carry out the proposed task (such as taking part in an exercise class). Barrier SE refers to an individual's confidence of overcoming barriers to PA (for example going for a run even when it is raining) or an assessment of efficacy in the face of challenges to be active. Barrier SE is sometimes referred to as self-regulatory SE (McAuley & Blissmer, 2002), a term which encompasses the agentic stance stressing the important role that cognitive skills play in behavioural performances beyond simply behavioural or skill beliefs.

Despite these theoretical differences, often in PA literature, researchers have failed to clearly state which form of SE they are referring to or have measured. It has also been noted that SE is frequently studied in isolation, with researchers failing to acknowledge the role of outcome expectancies, social support self-regulation and perceived barriers upon SE (Ayotte, 2007, Armitage & Conner, 2000). Studying these other factors in isolation is not to be criticised, as there is merit in examining the functioning of single factors in isolation. Further, the practicalities of examining this complex relationships requires large participant numbers and this goes some way to explaining why this much research focuses on individual components. However, not acknowledging a relationship exists, that may influence findings is a limitation of some research.

It is proposed that SE has three dimensions; magnitude, strength and generality (Bandura, 1986; McAuley & Blissmer, 2000). Magnitude refers to the belief that one can complete a task at a given level of difficulty and complexity. Strength is the level of certainty with which an individual believes the task will be successfully performed, given the magnitude of SE. Finally, generality is the belief that similar strategies will be effective in similar contextual arrangements (McAuley and Blissmer, 2000). For example, if someone gains efficacy through lifting a certain target weight in the gym, this efficacy may transfer to running a certain distance. It is important to note that efficacy beliefs are situation specific and measures of efficacy are specific to domains of functioning, rather than generalised in nature (McAuley & Blissmer, 2000), and efficacy measures are tailored accordingly to these particular areas (McAuley & Blissmer, 2002).

Sources of Self Efficacy

SE is thought to come from four main sources: prior success and performance attainment, imitation and modelling (vicarious experiences), verbal and social persuasion and judgements of physiological states (McAuley & Blissmer, 2002), and it is suggested these should be given consideration when developing interventions aimed at developing SE for PA (Bandura, 2002).

Prior success and performance attainment

Performance attainment refers to an individual's previous experience of success or failure and is thought to be the strongest of efficacy sources, as it is built on personal experiences. In relation to PA, SET would support the notion that a history of poor exercise adherence would relate to lower perceived SE about one's exercise capabilities whilst positive success of exercise would facilitate these efficacy expectations (McAuley & Blissmer, 2000). For practical application it has been suggested that activity logs and progress charts are tools that employ mastery experiences (McAuley & Blissmer, 2000).

Imitation and modeling

Imitation and modelling are the processes whereby individuals observe others either succeeding or failing in a particular task. This observation can be used as a point of comparison for individuals: observing others succeed in a similar situation may lead to an increase in SE; however, a decrease may lead to a reduction. Bandura (1986) proposes that modelling is likely to be more influential when the individual has some empathy with the model. This is particularly important where contact between an individual and a significant other (such as a teacher, exercise leader) is frequent and thus careful consideration should be given to those delivering an exercise class. Further, imitation and modelling through vicarious experiences may also be important in grouping individuals for exercise. For example, when someone may not perceive themselves to be fit enough to join an exercise class, but when a friend, who they perceive as 'less fit', partakes in the class, their SE to join in may be raised (Carron, Hausenblas, & Estabrooks, 2003). Further, there is evidence that some individuals feel most comfortable exercising with those of a similar age and level, and uncomfortable when around younger, more vigorous exercisers (Biddle, Fox, & Edmunds, 1994). Finally, visualisation or imagery is a form of vicarious experience whereby an individual self-models to envisage successfully mastering difficult situations.

Verbal and Social Persuasion

Verbal and social persuasion from exercise leaders, significant others and the self, are proposed as additional sources of SE. They are thought to be less powerful than the previous sources and Bandura proposes that in isolation, verbal persuasion is unlikely to be successful: “verbal persuasion alone may be limited in its power to create enduring increases in perceived efficacy...it can bolster self-chances if the positive appraisal is within realistic bounds.” (Bandura, 1997, p.101). It is proposed that verbal persuasion can be most effective for those who have a realistic chance of succeeding. Further, when there is regular contact between an exerciser and exercise leader, the opportunity for persuasion to be effective is likely to increase.

Judgments of physiological states

The final source of perceived SE is judgements of physiological states. In this instance, perceived SE is related to appropriate interpretation of somatic feedback. For example, whether a person perceives increased heart rate and sweating whilst carrying out exercise as being negative (they are going to have a cardiac arrest) or positive (they are burning calories and getting fitter). Whilst it is thought to be beneficial to teach individuals how to monitor these signs in order to develop their personal efficacy, this presumption requires further empirical testing (Biddle & Mutrie, 2008).

Self-Efficacy and physical activity

Investigating the role of SE in PA has been a common line of investigation in PA research. There are numerous studies highlighting SE as a positive correlate of PA behaviour in children and adolescents (Loucaides, Plotnikoff, & Bercovitz, 2007; Trost, et al., 2001). Dishman et al. (2004) demonstrated that SE mediates the effectiveness of an intervention programme to increase PA in adolescent girls and suggested that future interventions, designed to increase PA amongst this group, should specifically target SE. Biddle et al. (2005) identified that perceptions of competence to be physically active are a key correlate of PA in adolescent girls. Therefore, improving perceptions of competence to be physically active in adolescent girls may make a significant impact on PA levels. One such way of promoting higher levels of confidence is to increase the girls’ levels of SE. SE reflects the confidence of the individuals to change their behaviour (Bandura, 2001) and in PA research this is addressing an individual’s confidence to be physically active on a daily basis (Nahas et al., 2003).

2.4.2 Goals

A second key personal factor in Bandura's SCT model of health promotion is goal setting. It is suggested that individuals must be able to monitor their behaviour in order to change it as desired. A central component of these self-regulatory processes is the ability to goal set. Goals are used as a means of giving actions meaning and purpose. Goals are set according to an individual's value systems and sense of personal identity. Behaviour is directed by self-evaluating and adapting behaviour to give direction to one's aims, which are usually set in order to achieve self-satisfaction, develop a sense of self-worth and avoid behaviours that will result in dissatisfaction (Bandura, 2001). It is suggested that self-regulatory behaviour is essential to help plan, set goals and evaluate their exercise behaviour and that self-regulation may be influenced by each of social support, SE and outcome expectations (Figure 3.2).

2.4.3 Outcome Expectations

A third key personal factor is that of outcome expectations. There is often confusion regarding the differences between efficacy expectations and outcome expectations. Bandura differentiates between the two, explaining that efficacy expectations refer to one's ability to carry out a particular behaviour, whereas outcome expectations refer to the belief as to whether the behaviour will produce a particular result. More favourable outcome expectations are thought to be linked to increased PA behaviour and these can be influenced by SE and social support. Outcome expectations are thought to exist in three major formats physical, social and self-evaluative (Bandura, 1994; Bandura, 2001). Finally, the value we place on outcome expectancies influences the likelihood to drive behaviour change (Bandura, 1998). For example, an individual may perceive an increase in PA to be linked to greater fitness, but regardless of this belief, they place greater value on working rather than exercising. Consequently, they do not act on the expectation of PA, because the expectation of working has more value to them.

2.4.4 Agency and self-regulation in Social Cognitive Theory

Figure 2.3 highlights that in addition to SE, goal setting and outcome expectations, the personal component of SCT illustrates the capabilities individuals possess to implement positive behaviour change. Bandura (1986) revised SCT on the basis that humans possess certain capabilities that can help to explain one's behaviour. These capabilities are:

symbolising; forethought; vicarious learning; self-regulation and self-reflections. Symbolising capacity refers to one's ability to make symbols in order to understand or explain one's environment. Individuals process and transform past experiences through language and images in order to inform judgements and actions. Vicarious capabilities relate to an individual's ability to learn from not only one's own experiences but also from others, often referred to as observational learning.

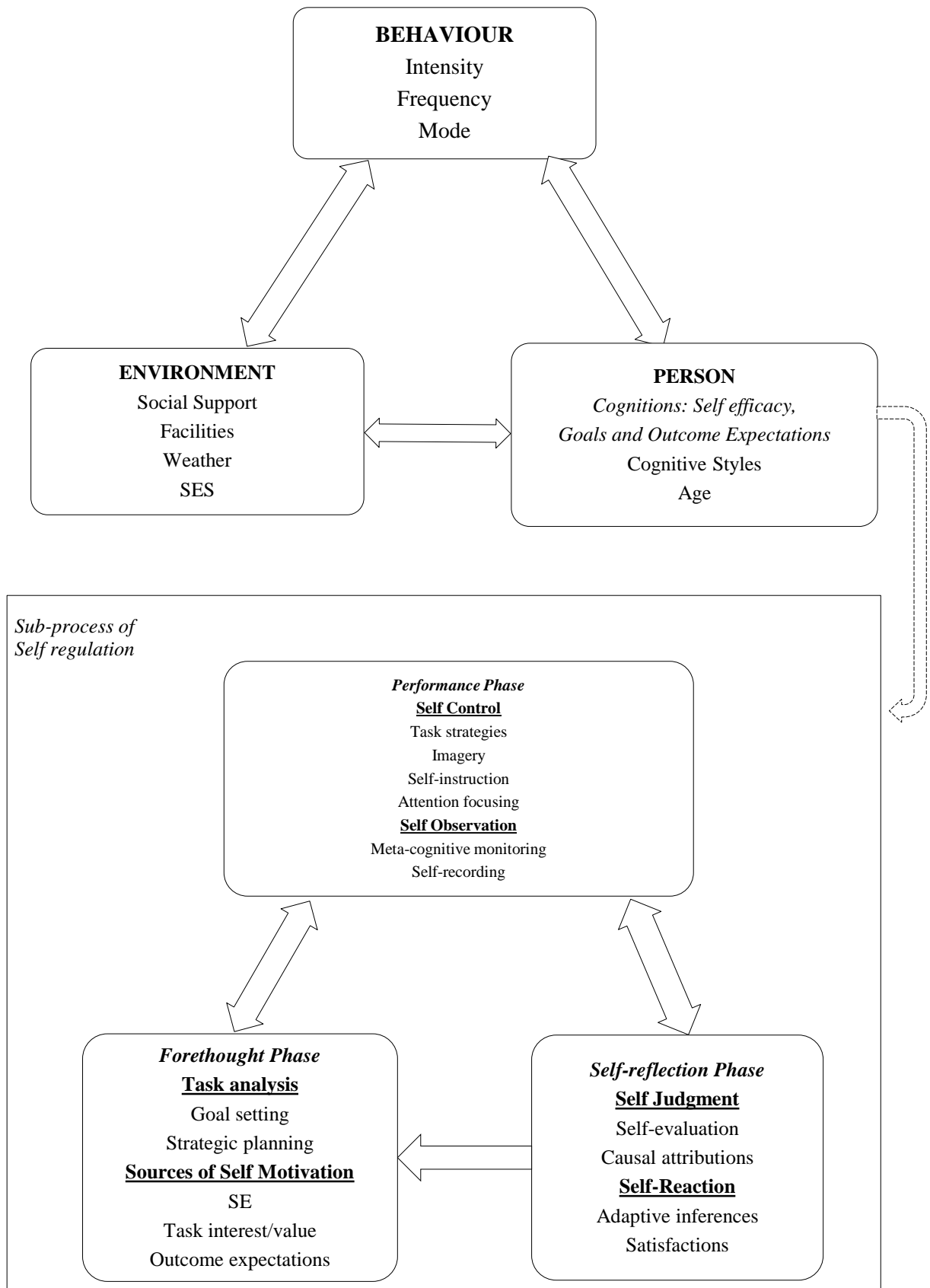


Figure 2.3: Model of triadic reciprocal interaction of Social Cognitive Theory and phases and sub processes of self-regulation (adapted from Bandura 1997; Zimmerman & Campillo, 2003, p. 239)

In 2001, Bandura refined SCT once again by stressing the role that agency plays in learning. Agency views humans as ‘agents’ who are proactively engaged in his/her own development and can make things happen by their actions (Pajares, 2002). In other words, they must have the ability to implement the plans that they have set. This is reliant on the ability to turn thoughts into action, and this requires the ability to self-regulate (Bandura, 2001). Self-regulation is the process by which an individual monitors and in turn adjusts their behaviour, environment or thought processes, in order to reach desired outcomes (Zimmerman, 2000). It is proposed that individuals with a sense of personal agency for effectively managing their behaviour, and a desire to proactively and efficiently manage their lives to achieve goals, are often referred to as self-regulated learners (Zimmerman & Cleary, 2006). A central component of personal agency is an individual’s belief in their ability to exert some level of control over their functioning and environmental events (Bandura, 1997). That is, efficacy beliefs are the core of human agency. Most often, SE is presented as a forethought process of agency, but it is thought to have an influence on all processes in the cyclical feedback loop of self-regulation. There are reciprocal links between SE and self-regulated behaviours and it is thought that SE is inherent in a system of self-regulatory beliefs and processes.

Self-regulation is ruled by several self-referent sub functions. Firstly, an individual must have the intention to carry out a certain act and then must plan to do so (Bandura, 2001). However, the intention to act is not sufficient on its own and requires other aspects of agency to be considered. These aspects are proposed as; forethought performance and self-reflection (Zimmerman & Cleary 2006). Figure 2.3 illustrates the situation of self-regulation within the triadic reciprocal interaction model of SCT.

Figure 2.3 also illustrates the sub processes of self-regulation in the form of a cyclical loop. The loop has three general phases; forethought, performance control and self-reflection. It is proposed that the processes involved in forethought influences the processes in the performance control phase, which in turn, influence the self-reflection phase. It is thought that the cycle is complete once an individual’s self-reflection processes influence the forethought processes in a subsequent attempt at learning (Zimmerman & Cleary 2006).

Self-regulation and the maintenance of physical activity

Bandura acknowledges that whilst one can get an individual to adopt beneficial health behaviours (such as exercise) it is more complex attaining maintenance of this behaviour.

It is proposed that maintenance is reliant on self-regulatory abilities and the importance an individual places on the behaviour in question. Bandura suggests that individuals should develop experiences of gaining control in difficult situations and develop coping strategies as means of developing self-regulatory strategies. Whilst self-regulation is recognised as an important skill in health behaviour, Bandura (2005) acknowledges that self-regulation skills need to be developed. In order to develop a sense of efficacy, Bandura (2002) suggests that an individual needs to learn how to monitor their health behaviour and the other social cognitive conditions in which they engage in it. Further, he promotes the use of sub-goals as a motivational tool and a means of guiding efforts, as well as the development of a number and variety of coping skills. He also suggests that individuals use intrinsic incentives and social support to help sustain the effort of changing health behaviour.

2.5 Environmental Aspects

The previous sections considered the personal component of SCT, and now the environmental component is discussed. Chapter 1 provided a definition of the environmental component of SCT and the differences between the social and physical environment. Along with behavioural and personal factors, the environment was introduced as a factor influencing PA and it was highlighted that the SCT proposes behaviour as a product and producer of the environment. The environment plays an important role in developing behaviours and must be supportive enough that a behaviour can be performed (Bandura, 1977). For example, if an individual wishes to cycle three times a week then they must own or have access to a bicycle in order to carry out this behaviour. In relation to health behaviour change, the environment to support PA must be in place if one is to succeed at becoming physically active. This is particularly important in a situation where an individual has little control over their environment, such as pupils attending PE within a school setting. Often the sources of efficacy information are found in the environment. For example, access to models individuals can observe and learn from are provided by the environment by an exercise leader or fitness instructors or an exercise DVD. Individuals can also be socially persuaded by adverts, peers and parents to increase their PA levels. Another aspect of the environment proposed as a key component of the SCT model of PA is social support. The environmental component of SCT is discussed in more detail in Chapter 5.

2.6 Social Cognitive Theory and Adolescents

Adolescence presents new challenges in the life course including biological, educational and social role transitions occurring concurrently. Throughout adolescence our cognitions change as a function of maturation and experience (i.e. memory, reasoning skills, attention span). During this time, the way in which an adolescent develops and uses their personal efficacy can have a huge influence on their life choices and futures (Bandura, 2005). Whilst adolescents face new challenges at this time in their life, Bandura proposes that rather than interpreting this time as one of turmoil and uncertainty, the principles of SCT emphasise individual growth through mastery and other experiences as a more positive and normative developmental process. Indeed, Bandura suggests that observed changes in adolescent functioning and well-being are a consequence of the structure of social systems rather than intrapsychic and biological upheaval, often thought as common to adolescence. In relation to health behaviours, it is noted that many habits that are developed in relation to healthy living are created during childhood and adolescence, and so it is key to target health behaviours at this time (Bandura, 2005).

2.7 Criticism of Social Cognitive Theory and other Social Cognitive models

Whilst SCT has been popular it is not without its critics. Firstly, it has been suggested that whilst triadic reciprocity is universally accepted, it has not been empirically tested (Baranowski, Perry, & Parcel, 1997). The reasons for this include the fact that the concept of triadic reciprocity shows that the same event can be a stimulus, a response and a reinforcement, depending on the flow of events (Bandura, 1977). Consequently, researchers have found it difficult to examine the relationship as it is necessary to investigate all factors at once to decipher which factor is influencing which. Further, interactions between factors may take time to become established and so it is suggested that a true examination of SCT variables needs to take place over a long period of time.

Other Social Cognitive models

It is important to note that the exercise literature commonly refers to social cognitive models as a group of theories (Maddux, 1993) and these should not be confused with Bandura's SCT, although it should be acknowledged that SCT provides the basic framework for each of them. Other social cognitive models or theories include; The Health Belief Model, Protection Motivation Theory, The Transtheoretical Model, The Theory of Reasoned Action, the Theory of Interpersonal Behaviour and The Theory of Planned Behaviour (Godin, Belanger-Gravel, Eccles, & Grimshaw, 2008). Bandura

(2000) suggested these theories had been developed across the key principle of SCT; psycho-social factors are key influences on health behaviour (Bandura, 2002).

Bandura (2002) proposes that many of these social cognitive models have overlapping determinants, but that these are often labelled differently. Early research focused around establishing differences between these theories and arguing for the best predictor of health behaviour. However, it has been suggested it is more productive to combine these theories to understand a multitude of health behaviours better (Maddux, 1993). However, Bandura highlights that whilst these theories can predict health behaviour, they do not offer a means to change it. For this reason, Bandura argued SCT is seen as the appropriate theory for health promotion as it offers a way to inform, enable, guide and motivate people to adapt habits that promote health (Bandura, 2002).

2.8 Practical application of Social Cognitive Theory

The current thesis is informed by SCT and thus, clear practical transference of the model is important. This chapter provided a detailed overview of SCT and outlined potential avenues for developing correlates of PA through the health promotion model. In order to develop the final intervention, the first three studies contained in the current thesis individually examine the three components of SCT (i.e. individual, environmental and behavioural components) within the specific population of adolescent girls. In turn, from the results of the studies, relevant strategies for the promotion of PA are proposed and these findings are then used to inform the development and practical application and delivery of SCT for promotion of PA in the final intervention.

2.9 Conclusion

This chapter has outlined the key principles of SCT and in turn, SET. Both theories are discussed in relation to health promotion, with an emphasis on the development of PA. The practical application of health promotion from a SCT perspective was introduced.

CHAPTER 3: METHODOLOGICAL FRAMEWORK

In order to effectively approach the research problem, it was deemed that an action research approach using quantitative and qualitative methodologies was appropriate. The aim of this chapter is to provide a general review of the methodologies adopted in the current thesis. Specifically, key aspects of action research are outlined. Further, features of both qualitative and quantitative approaches to research are described.

3.1 Key aspects of action research

Whilst each standalone study has adopted a specific methodology, overall, the thesis is underpinned by action research. Action research is most commonly used within health research, with a view to enhancing practice. There are numerous and wide ranging definitions of action research and Waterman and colleagues (2001), who sought to review the literature and research conducted within a health setting, provided the following definition;

Action research is a period of inquiry that describes, interprets and explains social situations while executing a change intervention aimed at improvement and involvement. It is problem-focused, context-specific and future-oriented. Action research is a group activity with an explicit critical value basis and is founded on a partnership between action researchers and participants, all of whom are involved in the change process. The participatory process is educative and empowering, involving a dynamic approach in which problem identification; planning, action and evaluation are interlinked. Knowledge may be advanced through reflection and research, and qualitative and quantitative research methods may be employed to collect data. Different types of knowledge, including practical and propositional, may be produced by action research. Theory may be generated and refined, and its general application explored through the cycles of the action research process (Waterman, Tillen, Dickson, & De Koning 2001, p. 1).

Whilst this definition is lengthy and complex, it identifies some critical features of action research that are applicable to this thesis. The definition highlights; i) action research looks at a current situation and seeks to identify and describe problems within this situation and identify possible causes and solutions; ii) action research includes an active intervention in response to local problems whereby the researcher works collaboratively with the users or stakeholders so that the research is relevant and so that the participants

are empowered by the process; iii) the typically cyclical process of action research which incorporates situation analysis, planning, action (implementation of change) and evaluation and reflection; iv) a number of methodologies may be used throughout action research; v) by its very nature, action research should have an action outcome, whether that be practical application or a refinement of a theoretical standpoint.

3.2 Action research in the current thesis

Rationale

Action research has been conducted in a number of different environments, usually with a social research focus (Murray, 2004). The scale of study underpinned by action research is wide; there is evidence of action research seeking to reach a whole community (Giesbrechy & Rankin, 2000; Yeich, 1996), whilst other projects focus on small groups who share a common interest or concern (Piran, 2001; Stewart & Bhagwanjee, 1999). The current study has a small-scale focus, but seeks to influence community PA practice in Scotland. Limited PA research has included action research (Frisby, Crawford, & Dorer, 1997), however, evidence from previous action research studies and the underlying principles of action research suggests it is a highly suitable method for undertaking research in the field. Further, as action research involves implementing and evaluating solutions to specific problems, it bridges the gap between research and practice, and as such has been recognised as a useful method for the current thesis.

In relation to adolescent girls, it was anticipated that action research was appropriate as adolescent girls have voiced that their opinions are often ignored (NHS Health Scotland, 2008) and they have been reported as a difficult population to engage with. Thus, action research would allow the researcher an opportunity to immerse herself in the research environment and give credence to opinions projected.

Implementation

Figure 3.1 illustrates a detailed model of action research, distinguishing five phases to be conducted within each research cycle (Susman, 1983).

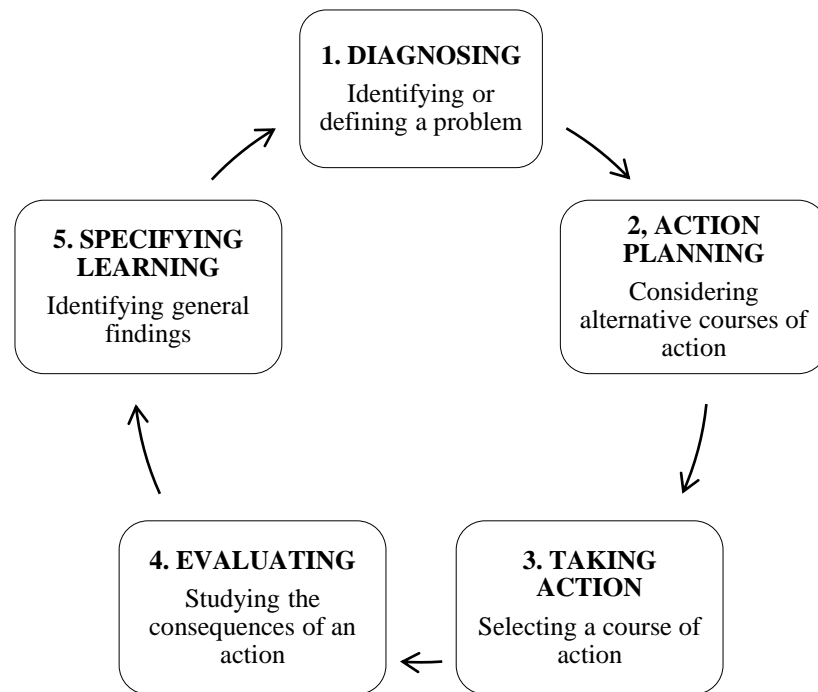


Figure 3.1: Detailed action research model (adapted from Susman, 1983)

Figure 3.1 illustrates that the first phase of action research is problem identification whereby data are collected to provide a more detailed picture. Action planning then occurs, where a number of possible solutions are considered and a firm plan of action emerges. This leads to the action of data enquiry or an intervention taking place. Data are then collated and analysed, findings are then interpreted for specific learning outcomes. Finally, the initial problem is reassessed with regard to the new knowledge, and another cycle begins. This process can continue until a problem is solved or the initial line of enquiry has been satisfied (O'Brian, 2001).

In the case of the current thesis, problem identification refers to a literature review and gathering information from stakeholders. Action planning was done in collaboration with stakeholders and with reference to relevant literature. Data enquiry took the form of an intervention or focus group research. In turn, evidence from each study was gathered and analysed. Finally, research reflections were used to inform future research.

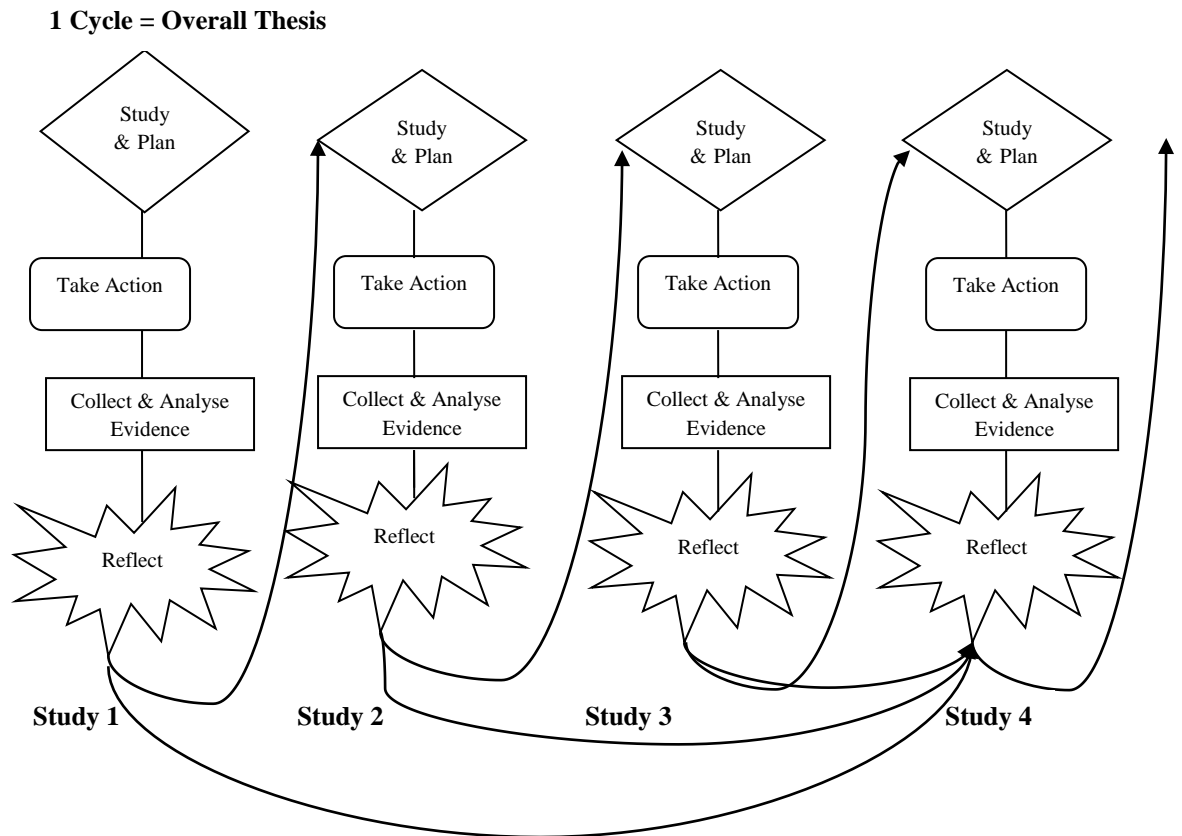


Figure 3.2: Cyclical process of action research, taken from Riel (2010)

The cyclical process of action research adopted in the current thesis is illustrated in Figure 3.2 (Riel, 2010). The current thesis reflects the cyclical process of an action research approach at a macro-level with the overall thesis design, and at a more micro-level in the design of each individual study. Whilst the first three studies in the current thesis were used to inform the final study in Chapter 7, each study was also used to satisfy its specific research aims. Figure 3.2 illustrates the development and administration of the three primary studies in the current thesis and the subsequent analysis and reflection occurring after each. This process is continued into the final study where reflections of the 3 prior studies influence its development and delivery. The final study follows the same cyclical process of planning, action, analysis and reflection.

Reflective Practice and Action Research

Action research often utilises an expert in the field who is interested in examining their role or the role of their peers in helping to solve a specific problem, and reflections are key to this process. The primary researcher is a British Association of Sport and Exercise Science (BASES) accredited sport and exercise psychologist and has undergone level 1 COSCA counseling skills training and NHS training in PAconsultations. Throughout the

research programme, the author was enrolled on the BASES accreditation scheme. Part of this scheme requires neophyte researchers to develop their reflective practice. Reflective practice is strongly related to action research as it requires the researcher to examine their practice within a certain context. A more explanatory definition is that it is a cognitive process, which brings together deliberate exploration of thoughts, feelings and evaluations that are focused on researcher skills and outcomes (Knowles & Saxton, 2010). It is proposed that reflective practice helps researchers to explore good practice, identify areas for improvement and formulate ideas for change (Knowles et al., 2001). Action research requires an individual to examine their influence and contribution to a particular situation. Further, the process of action research has been defined as a spiral of 'collective self-reflective enquiry' (Kemmis & McTagert, 1988). As such, action research and reflective practice are complimentary methodologies in the current thesis. Both action research and reflective practice support the use of a reflective diary or log in which the researcher records events, reflection on events and learning that has arisen from this reflection (McNiff & Lomax, 2003). In some chapters, reflections are provided as diary excerpts.

3.3 Research paradigm

Paradigms are important in that they shape how we see the world. In a research environment, the paradigm a researcher adopts will reflect the manner in which research is designed, data collected and analysed and the results presented (Williams, 1998). Establishing a research paradigm enables a researcher to know their role in the research process, view the development of a research project and view other perspectives. There are a number of different research paradigms highlighting a number of philosophical stances. The main research paradigm for several centuries has been positivism (O'Brian, 2001). At a basic level, positivism proposes a belief in an objective reality and that our knowledge of this is gained from sense data that can be directly experienced and verified between independent observers. Positivism proposes that humans perceive the world as straightforward and independent, and that phenomena are explained through human discovery, using empirical testing and scientific theory. Positivism is most commonly associated with quantitative measures and findings, such as testing hypotheses or causal explanations, and is most commonly presented in number format (Coyle, 2007; Lincoln and Guba, 1985; O'Brian, 2001). Despite the vast use of a positivistic approach, it has

been criticised as it does not encourage understanding of the richness and complexity of human behaviour, particularly in context-specific situations (Patton, 1990).

In more recent years, new research paradigms have emerged which consider the constraints of positivism on social science research, and these are often termed post-positivistic approaches. Of these, the constructivist approach proposes that rather than an objective reality, things exist because of social interactions. Similarly, the principles of the interpretive paradigm are of a socially constructed, subjectively based reality that is influenced by culture and history (O'Brian, 2001). A Naturalistic approach proposes that there are multiple views of reality. Naturalistic approaches are interested in the enrichment of understanding of the experience of the individual, in order to construct the reality of a specific situation. In general terms, qualitative enquiry most often adopts a post-positivistic philosophy.

There have been absolutist claims for only the use of one paradigm or another in research (Lin, 1998). However, through careful and considerate debate, a more eclectic stand point has become more acceptable in recent years (Lin, 1998; Patton, 2002). In line with this, it has been suggested that researchers adopt the methods and epistemology which best reflects the purpose of inquiry, the questions being investigated and the resources available (Patton, 1990). In line with this, it has been suggested that action researchers adopt the necessary methods and philosophical assumptions to act upon the conditions they are faced with (O'Brian, 2001), something the current thesis endeavors to do.

3.4 Mixed-methods approach

Despite highlighting an awareness of the philosophical stances, it is more pertinent in the current thesis to focus on the methodological approaches utilised throughout the research process. Action research allows the adoption of a variety of methods; it is suggested that researchers adopt any method which will aid them in analysing the problems or questions they wish to address, and in turn initiate change within a population (Marks & Yardley, 2003). In order to address this research aim, the current thesis will adopt a mixed-methods approach; one in which qualitative and quantitative methods are used to complement each other (Creswell, 2003). The use of mixed-methods has received support in applied fields of research (Meadows, 2003; Tashakkori & Teddie, 2003).

3.5 Quantitative approach

Until relatively recently, quantitative methods were those most commonly adopted in health research (Meadows, 2003). Quantitative methods use numerical indicators to identify the relative size of a particular phenomenon (Matveev, 2002). This is an effective way to divide up phenomena, so that elements of an overall framework or conceptual plan can be manageable (Sofaer, 1999). There is a strong history of quantitative research in the health domain and this is reflected in designs such as randomised controlled trials and experimental methods (Meadows, 2003). In general, quantitative methods are used to test and explain psychological processes. In the current thesis, quantitative research focuses on the use of standardised methods and measures (i.e. questionnaires) to gather data, which is then transformed into numerical data for statistical analysis (Meadows, 2003).

3.6 Qualitative approach

Despite a strong rationale for the use of quantitative methods, the fields of health and psychology research have, in recent years, employed qualitative methods either in isolation or combined with quantitative approaches (Sofaer, 1999). Moreover, the NHS has highlighted qualitative research as a priority in their research and methodology development programme (Dixon-Woods & FitzPatrick, 2001). At a basic level, qualitative research seeks to determine ‘why’ rather than ‘how many’, as is often presented by quantitative research. It has been suggested that the aim of qualitative research is: “...to understand and represent the experiences and actions of people as they encounter, engage, and live through situations.” (Elliot, Fischer, & Rennie, 1999, p. 216). It is proposed that qualitative enquiry seeks to help understand social phenomena in an applied setting and has an emphasis on the meanings, experiences, attitude and view of participants, rather than providing quantified answers to a research question (Pope & Mays, 1995). In general, qualitative research is presented in the form of words or images, rather than numbers, which have been based on observations, interviews or documents (Meadows, 2003).

It has been suggested that words, which have been reported as stories or incidents, can have a more profound effect on the reader and can thus prove more convincing than pages of summarised numbers (Miles & Huberman, 1994). Consequently, the inclusion of qualitative methods will hopefully provide a rich account of teenage girls’ PA experiences and potentially, a lasting impact on the reader.

3.6.1 Qualitative methods in physical activity research

There is a wealth of quantitative research in the field, where questionnaire data is analysed to provide information relating to the direction and strength of trends in participation, and indicators of PA beliefs and attitudes. Indeed, key research relating to correlates of PA in adolescents was reviewed in the introduction to the current thesis. Whilst this research has been fundamental to existing PA knowledge and the basis of some PA practice, there is a requirement for an additional approach which will provide in-depth insight into individuals' experiences and perceptions of PA and motivators and barriers to participation (Thomas, Nelson, & Silverman, 2005). Consequently, qualitative methods in PA research have become more common place (Thomas & Nelson, 1996). In 2006, Allender and colleagues (Allender, Cowburn, & Foster, 2006) conducted a review of qualitative studies examining participation in sport and PA in adults and children. Twenty-four papers in the review met all the inclusion criteria, and of these, four were related to PA participation in adolescent girls. Of these studies, a number of qualitative methodologies were employed, including semi-structured interviews (Coakley & White, 1992), in-depth interviews (Cockburn & Clarke, 2002), and a combination of semi-structured interviews and focus groups (Flintoff & Scranton, 2001; Mulvihill, Rivers, & Aggleton, 2000).

A more recent report, produced by NICE, presented qualitative research conducted to highlight more qualitative correlates of PA in adolescent girls (2009). This report contained 15 qualitative studies (including the four mentioned in Allender et al.'s 2006 review). As with the earlier review, a series of interview techniques were employed (paired, individual and in-depth) as well as focus groups, narrative approach and the nominal group technique. A narrative approach is often referred to by the way an individual tells their story as a means to convey personal experiences (Bruner, 1990). Nominal group technique allows participants to work in the presence of each other, but ideas are written rather than presented verbally to the group (Sample, 1984). Focus group research is group discussion led by a moderator (often the primary researcher). Focus group research is used in the current thesis and is discussed in more detail in Chapter 5.

3.6.2 Trustworthiness in qualitative research

A constant concern in qualitative research is how to judge the quality and validity of this form of research. Some researchers suggest that qualitative text should be based on the extent to which it engages the reader emotionally, whether it seems authentic and whether

it contributes substantially to the field of interest (Sparkes, 2002). Others have more broad criteria, stating that “There are no simple formulas or clear cut rules on how to do credible, high quality analysis. The task is to do one’s best to make sense of things.” (Patton, 2002, p.570). There have however, been more explicit and prescriptive criteria on which qualitative data should be judged, and it has been proposed that qualitative data should be judged on the basis of ‘trustworthiness’ (Lincoln & Guba, 1985). It was proposed that criteria for achieving trustworthiness established credibility, transferability, dependability and conformability, and this is a common framework on which qualitative analysis is critiqued. However, there are concerns about the prescriptive nature of these guidelines as potentially restrictive and thus the current thesis adopted Yardley’s (2000) three broad principles for assessing the quality of qualitative research. Yardley’s (2000) guidelines are wide ranging and provide a variety of ways for determining quality without constraining qualitative researchers. They can be summarised as; sensitivity, commitment, rigour, transparency, coherence and impact and importance.

3.7 Conclusion

The current chapter outlined the features of action research and provided a rationale for the use of this methodological approach in the current study. This was followed by an outline of the mixed methods approach adopted in the current thesis and discussion of qualitative and quantitative methodologies.

CHAPTER 4: TARGETING THE PERSONAL COMPONENT OF SOCIAL COGNITIVE THEORY THROUGH A PHYSICAL ACTIVITY CONSULTATION INTERVENTION

The current chapter focuses on the personal component of SCT and seeks to implement and evaluate a small-scale intervention focused on enhancing personal correlates of PA through a counselling based intervention. A summary of the literature surrounding such interventions is provided and in turn, PA consultations (Loughlan & Mutrie, 1995) are introduced as a possible means for enhancing PA behaviour in adolescent girls. An intervention based on PA consultation was designed and subsequently evaluated to assess its effect on correlates of PA and PA behaviour. Qualitative data were also collected to assess the feasibility of implementing such an intervention on a larger scale. The results are discussed in line with previous literature relating to PA consultations and with consideration for the development of a larger scale intervention.

4.1 Personal correlates of physical activity

Previous chapters have highlighted that PA behaviour is influenced by a variety of factors and these are categorised as physiological, psychological, socio-cultural and ecological (Biddle, Whitehead et al., 2005; Sallis & Owen, 1999; Sallis, 2000; Sallis & Owen, 2002; Taylor, Baranowski, & Sallis, 1994; Taylor & Sallis, 1997). Within SCT, it is suggested that these correlates can be assigned to each of the personal, environmental and behavioural aspects of the model. It is also accepted that the complex nature of human behaviour means that no one factor alone can be accountable for variance in PA levels (Sallis et al., 2002), but rather, factors are subject to complex interactions.

The current thesis aims to develop an active-gaming intervention (presented in Chapter 7) underpinned by SCT. SCT proposes that in order to be successful, an intervention must seek to target all three aspects of the model (i.e. personal, environmental and behavioural). Nonetheless, in order to develop a large scale intervention, it is appropriate to consider components of the intervention in isolation so that findings can be used to specifically inform future interventions. In line with this, the current chapter is primarily concerned with targeting personal correlates associated with PA. Chapter 1 introduced personal correlates of PA and these included SE, enjoyment, perceived competence, body image and attractiveness and self-esteem. Chapter 3 indicated that the SCT model of health promotion identified SE and outcome expectancies as key individual correlates of PA. In line with this, the current chapter focuses on these personal correlates of PA.

Nonetheless, the very nature of SCT means there is overlap and interaction between the three factors of personal, environmental and behavioural and it is difficult to view each in isolation. Thus, in the current intervention, correlates traditionally assigned to behavioural and environmental components of the model are likely to be influenced.

4.2 Physical activity counselling and physical activity consultations

The problem of low level PA in adolescent girls was documented in Chapter 1. Accordingly, a wealth of PA interventions have been developed to target PA behaviour and correlates of PA within this population. Chapter 7 in the current thesis provides an overview of interventions focused on the target population, whilst the current chapter will provide an overview of counselling based PA interventions.

Counselling based PA interventions can be described as an individual receiving PA assistance from health professionals through advice and counselling (Biddle & Mutrie, 2008). One counselling based approach which has received attention in PA literature is motivational interviewing (MI) (Rollnick & Miller 1995). MI has been defined as: ‘a directive, client-centered counselling style for eliciting behaviour change by helping clients to explore and resolve ambivalence’ (Rollnick & Miller, 1995, p. 325). For this reason, it can be considered a personal level intervention. This approach was adapted by Loughlan and Mutrie (1995) in order to develop what they refer to as PA consultation. In this instance, the MI framework and the available knowledge relating to successful PA behaviour change was used to present guidelines for adopting a person-centered approach to enhancing PA behaviour.

Physical activity consultations

Despite stemming from a person-centered counselling approach, Loughlan and Mutrie (1995) highlighted that there are some distinctions between a counselling session and a PA consultation. Namely, an individual will use counselling skills, adopt a counselling approach and ensure confidentiality; however, the approach does not encourage a long term relationship between researcher and client. Further, a central element of PA consultations is that the researcher gives more advice to participants than in a traditional counselling session. Finally, rather than being based on a clinical issue or crisis, PA consultations are based on a more basic problem (i.e. not understanding PA guidelines and how to fit them into one’s lifestyle).

PA consultations are based on discussion between a participant and a researcher about increasing PA. In line with person-centered counselling, PA consultation proposes that clients shape their own solutions to problems they may face. Based on the Transtheoretical Model (TTM) (Prochaska & DiClemente, 1984) PA consultations employ cognitive and behavioural strategies to increase and maintain PA. The guidelines (Loughlan & Mutrie, 1995) suggest that a PA consultation should include the exploration of exercise history, discussion relating to an individual's exercise likes and dislikes, advantages and disadvantages of change, barriers to change, social support available, goal-setting and relapse prevention. It is suggested that an average consultation with a sedentary adult takes between 20 and 30 minutes to complete, and in essence is a short term intervention.

An alternative approach to PA counselling has been proposed by Laitakari and Askainen (1998) which encompasses a more detailed assessment procedure. Laitakari and Askainen's approach includes quality of life, health status, health practice and living environment, which are acknowledged as potentially beneficial, but may affect the feasibility of delivering a consultation due to time constraints (Biddle & Mutrie, 2008). Further, there is no empirical evidence to support the use of a longer intervention over the brief solution-based intervention approach developed by Loughlan and Mutrie (1995) (Biddle & Mutrie, 2008). Support for the effectiveness of Loughlan and Mutrie's (1995) approach is provided below.

Physical activity consultation and links with Social Cognitive Theory

Chapter 3 introduced Bandura's SCT model modified to health promotion (Figure 4.1). The health promotion model appears to be a clear application of SCT, which is a rather dense theory. Figure 4.1 illustrates that the model proposes SE, goal setting, outcome expectations and social structural factors as determinants of PA behaviour. Although, based on the Stage of Change model, PA consultation targets each of the aforementioned mechanisms detailed in Bandura's model (as is detailed in the coming sections). It therefore appeared to be an appropriate means of targeting PA behaviour and psycho-social correlates of PA outlined by Bandura (2002).

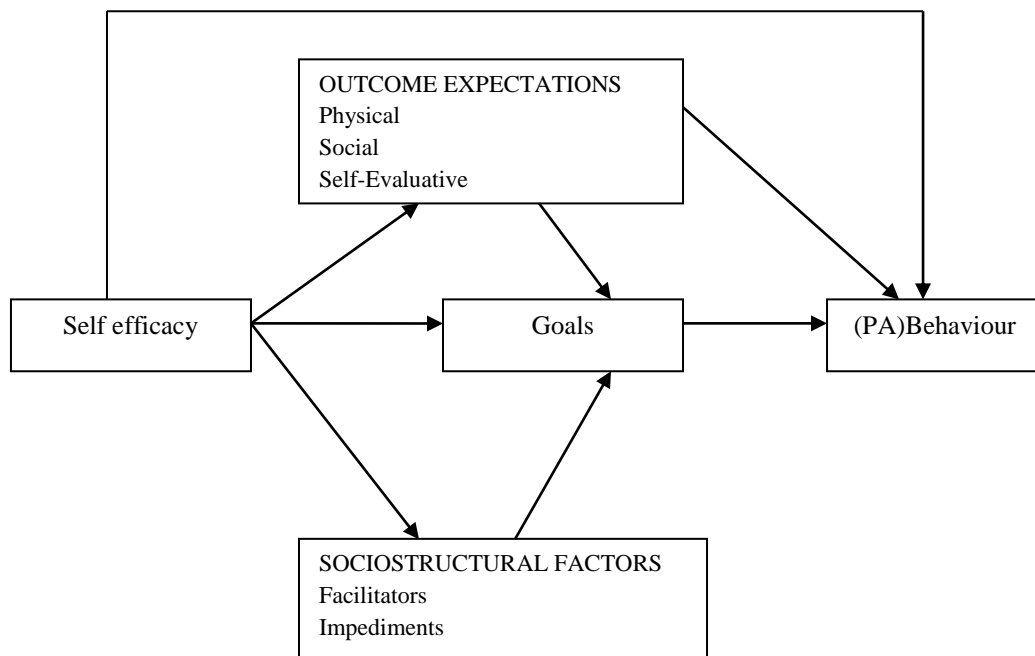


Figure 4.1: Bandura's Social Cognitive Theory Model of Health Promotion (Bandura, 2002)

In line with the model, Bandura (2005) proposed that an effective health promotion programme contains four major mechanisms: Firstly, the informational mechanism whereby individuals are educated about the risks and benefits associated with different health behaviours, something which is emulated in a PA consultation. The second develops social and self-management skills to help foster preventative practice, also a key focus in PA consultations. The third component is to develop SE, especially in the face of adversity. Finally, he proposes the development of sources of social support for the preferred change in habit, both of which are promoted during a PA consultation. Bandura (2005) highlighted that the first of these components is relatively simple, but developing the other three aspects requires greater effort and sometimes assistance and PA consultations may be an effective way of assisting individuals achieve such behaviour change. Whilst the key aim of the current intervention is to target the personal component of the SCT model, PA consultations may also influence the environmental and behavioural aspects as is illustrated in the model. For example, identifying facilitators and barriers to PA not only targets personal and behavioural issues, but may also include social and physical environmental factors.

4.3 Transtheoretical model

Despite the fit with SCT, the most common theories adopted for PA counselling interventions are proposed as the Self-Determination Theory (Deci & Ryan, 1987) and the TTM, (Prochaska & Di Clemente, 1984) as outlined by Breckon et al. (2008). In order to fully consider the theoretical basis of the PA consultations, it is appropriate to consider the TTM (Marcus & Owen, 1992). The TTM has shown that when individuals display successful behaviour change (such as increased exercise behaviour) they move through stages of decision making and behaviour change. TTM was originally used in smoking cessation programmes and successful application saw the development into PA research (Marcus & Owen, 1992). TTM, sometimes referred to as the stage of change model, describes health behaviour change and maintenance of this behaviour as a process that occurs over time as a function of an individual's behavioural history and motivation (Wallace, Buckworth, Kirby & Sherman, 2000). A key feature of this model is that it acknowledges that individuals are likely to make several attempts at behaviour change before they are successful.

Chapter 3 alluded to the fact that there are several social cognitive theories of PA and the TTM is one such theory. It was developed from several theories of psychotherapy and behaviour change (Lowther, Mutrie & Scott, 2007) and has been used to understand the stages individuals progress through, and the cognitive and behavioural processes they use while changing behaviours. As it now stands, the TTM covers four core constructs that influence an individual's readiness to change: the stages of change, the processes of change (experimental and behavioural), decisional balance and SE (Lowther, Mutrie & Scott 2007).

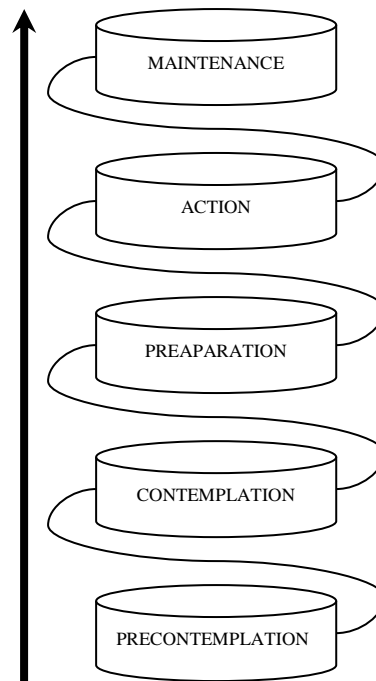


Figure 4.2: The behavioural change spiral (adapted from Marcus et al., 1992)

Stages of change

The TTM proposes that an individual progresses through five key stages of change when developing a new behaviour. These stages are proposed as: pre-contemplation, contemplation, preparation, action and maintenance, as illustrated in Figure 4.2.

The model highlights that the initial stage of the model is pre-contemplation and it refers to an individual who does not recognise a behaviour-related health problem or someone who has no intention of changing their behaviour. In the current study, this would refer to an individual who does not believe that she is low active or does not think it is important to modify her behaviour. Contemplation is the second stage of the model and refers to individuals who are seriously considering changing her behaviour but have not yet initiated a change. In the current thesis this refers to an individual who recognises she is not achieving the PA recommendations, but has not yet done anything to increase her PA. The third stage of the model is preparation whereby an individual prepares to undertake the desired change. The fourth phase is action and this refers to the stage where an individual is changing or adapting her behaviour in order to address the health problem. This would be an individual who is taking part in more PA. The final stage of TTM is maintenance and this is reached when an individual has established a new behaviour pattern and has consistently achieved this new behaviour. In relation to PA, this would be

an individual who has reached PA guidelines for more than six months. Generally research related to PA consultations has targeted individuals in the contemplation and preparation stage of change (Biddle & Mutrie, 2008).

How we change: Mediators of change

Individuals may proceed through the aforementioned stages of change of their own accord. However, sometimes individuals may require some assistance to change their behaviour and, in these instances, help from a health professional may be appropriate. Within the TTM model, three mediators of change are proposed: processes of change, decisional balance and increasing SE (Lowther, Mutrie, & Scott, 2007). In turn, each is a core feature of PA consultation.

Processes of change

Several psychological constructs of the TTM are associated with the 10 processes of change that are considered to be both the explicit and the concealed activities that people progress through, in order to make the successful behaviour change transition. The TTM was adapted to develop the 'stages of exercise behaviour change' (Marcus, Rossi, Selby, Niaura, & Abrams, 1992) whereby the 10 processes of change were generalised to exercise behaviour (Table 4.1). In turn, guidelines relating to the practical application of these processes in a PA consultation were developed (Table 4.2)

Whilst the stages of change construct of the TTM has been studied extensively and relatively successfully in PA, the processes construct has not been subject to as much examination. In particular, there has been a lack of research in UK-based longitudinal studies (Lowther, Mutrie, & Scott 2007). Marcus, Rossi et al. (1992) suggested that successful behaviour change is reliant on engaging the right process at the right stage, however more recent research challenged a stage by process interaction suggesting that an individual employs a variety of processes across all stage transitions (Marshall & Biddle, 2001).

Table 4.1: The ten processes of exercise behaviour change related to physical activity

Process of Change	Definition Related to Physical Activity
EXPERIENTIAL	
Consciousness Raising	Efforts by the person to gain information and understanding about exercise and its benefits.
Dramatic Belief	Experiences and expressions of feelings about inactivity and the consequences of inactivity.
Environmental Re-evaluation	Consideration of how inactivity is related to the person's physical and social environment.
Self Evaluation	Reappraisal of how the person feels (emotionally and cognitively) about themselves and physical activity.
Social Liberation	Awareness of the person as to the availability of physical alternatives (such as active commuting)
BEHAVIOURAL	
Counter Conditioning	Substituting alternative behaviour to the sedentary behaviour (i.e. becoming more active)
Helping Relationships	Trusting and using the support of others whilst becoming physically active
Reinforcement Management	The person rewards themselves or gets rewarded by others when exercising
Self Liberation	A commitment to and a belief that the person can continue to exercise
Stimulus Control	Controlling stimulus that can cause physical inactivity such as the removal of labour-saving devices or the provision of stimulus to increase activity, such as the provision of exercise posters.

Adapted from Marcus, Rossi et al. (1992). Copyright 1992 by the American Psychological Association, cited in Lowther, Mutrie and Scott (2007) and Hughes and Mutrie (2006).

In order to try and bridge the gap in UK-based research relating to the processes of change and exercise behaviour, Lowther, Mutrie and Scott (2007) investigated the stage and process interaction in a UK population. The study had 2 key aims: firstly, to identify key processes of exercise behaviour change associated with movement through stages of exercise behaviour change. The secondary aim was to examine differences in stages of behavioural change for the experiential and behavioural processes of exercise behaviour

change and examine any difference between experiential processes and behavioural processes for each stage of exercise behaviour change.

Overall, the study supported previous work in the area of stage and process research (Lewis, Marcus, Pate & Dunn, 2002; Marcus et al., 1992). Results supported a stage by process interaction and identified important processes of exercise behaviour change associated with movement through the stages of exercise change. In line with Marcus et al. (1996), they identified self-liberation as important at each stage of progression, further they highlighted stimulus control as an important process when progressing from contemplation to preparation. It is suggested that both sets of processes are important when entering into the stage of action. Use of experiential and behavioural self-liberation, combined with helpful relationships was associated with movement into maintenance. These results strengthen the use of the TTM within the British population. Consequently, it is suggested that future stage-matched interventions should focus on integrating both stages and processes, something which PA consultation aims to do (Table 4.2) (Lowther, Mutrie, & Scott, 2007).

Decisional balance

A key component of TTM is decisional balance; the process of weighing up the pros and cons of a particular activity. Decisional balance is based on the conflict model of decision making (Janis & Mann, 1977) and is defined as the potential benefits (pros) and costs (cons) of behaviour change (Prochaska & Velicer, 1997). In an examination of exercise behaviour (Nigg & Courneya, 1998), a shift in decisional balance in the action stage of TTM was reported and pros were identified as important in advanced stages, whilst the cons became less important. Research shows that pros and cons change as an individual moves through stages of change (Biddle & Mutrie, 2008; Nigg, Courneya & Estabrooks, 1997). DiClemente and colleagues (DiClemente, Prochaska, Velicer, Fairhurst, Ross, & Valasquez, 1991) reported that an assessment of the pros and cons is important in order to understand and predict transitions between the first three stages of change (i.e. pre-contemplation, contemplation and preparation), but these are less important predictors of progress in the action and maintenance stages.

In chapter 3, it was highlighted that Bandura's (2005) model of health promotion suggested that in order to enhance health behaviour an individual should have an understanding of the barriers and facilitators to PA. Helping an individual to develop their

awareness of the pros and cons of PA central to their own situation, is another strategy promoted by PA consultation (Loughlan & Mutrie, 1995; Hughes & Mutrie, 2006). Generally, a PA consultation begins with a client completing a decisional balance sheet and it is suggested that in order for the intervention to be successful, an individual must view that the gains of PA outweigh the losses. The researcher is central in helping the client reach this belief. PA consultation proposes that the client discusses their perceived barriers to PA with the researcher and they engage in conversation as to how these barriers can be overcome. Time is often cited as a barrier to PA (Biddle et al., 2005; Loughlan & Mutrie, 1995) and PA consultation recommends discussion of time management techniques to overcome this barrier, and that the researcher helps the client recognise that exercise for health does not have to be hugely time consuming.

Self-Efficacy

As with SCT, SE has been identified as an important feature of the TTM (Prochaska & Velicer, 1997). In general terms, as individuals progress through the stages of change their levels of SE have been reported to increase (Prochaska & Marcus, 1994) something also reported within an adolescent population (Nigg & Courneya, 1997).

Chapter 3 provided a summary of the key features of SET. It identified SE as a central construct in health promotion and it is proposed that SE is the link between other psychosocial constructs and PA behaviour. PA consultation works with a participant to aid them in developing their SE through targeting sources of SE. It has been suggested that there are four key sources of SE; performance attainment, vicarious experience, social and verbal persuasion and judgements of physiological states (detailed in Figure 4.3).

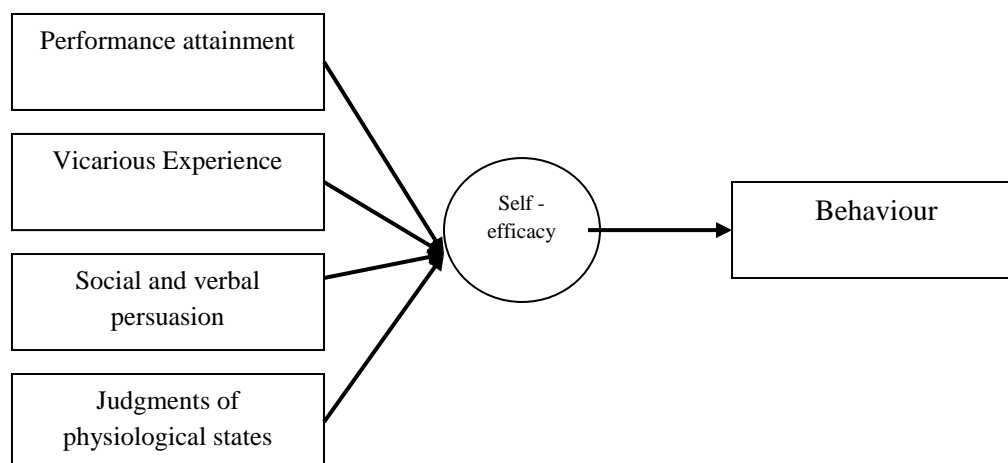


Figure 4.3: Sources of self-efficacy adapted from Bandura (1997)

PA consultation encourages the development of these sources of efficacy and increases outcome expectations through the application of a number of practical techniques. These techniques include the development of social support and positive self-talk, which relate to the efficacy source of social and verbal persuasion, and goal-setting skills, which aims to enable individuals to focus on performance attainments, each of which are discussed in the sections below.

Criticisms of the transtheoretical model

Whilst the rationale for the development of PA consultations utilising TTM is robust, there are some criticisms of the theory. Despite the comparison's drawn between TTM and SCT in the current thesis, Bandura has criticised the use of a stage based model in health promotion (Bandura, 1997). More recently, 'Health Education Research' published a lively debate on the use of the TTM in health promotion. In their critique of the theory Adams and White (2004) highlight three key reasons why they believe the TTM should not be applied to health behaviours. Firstly, they suggest that PA is too complex a behaviour – PA is not technically a single behaviour but a complex category of different specific actions. Secondly, they suggest lack of validated staging algorithms - they highlight that the process of calculating stage of change has not been validated and researchers have sometimes changed the measurement as they see fit. Finally, they suggest that there is a possibility some of the real determinants of activity change are not included in the Model as it is focused on decisional balance, SE and process of change, but they suggest the evidence for using these measures is lacking a strong basis. Nonetheless, despite the acknowledgement of problems with the model, Brug et al., (2005) postulate that whilst there are problems, stage based interventions have illustrated some positive results. Accordingly, they encourage further research focused on improving the stage of change approach to promoting complex health behaviours such as PA.

With regards to adolescents, a systematic review of literature applying TTM to exercise, Spencer, Adams, Malone, Roy and Yost (2006) reported mixed results. They highlighted that a level of caution should be shown when applying the stage of change model to adolescents, as evidence supporting the use of the model with this population is limited.

Despite highlighting some of the negative features of this model, it is important to highlight that the current study does not seek to investigate the applicability of TTM to

exercise behaviour in adolescent girls, but rather to examine the effectiveness of a TTM based PA consultation intervention.

4.4 Transtheoretical model and physical activity consultation: Theory to application

It is proposed that PA consultation works by targeting the key mediators of change in the TTM, namely the processes of change, outcome expectancies (also referred to as decisional balance), SE, and relapse prevention. Table 4.2 highlights the component of TTM associated with how an individual changes their behaviour and identifies the techniques and tools promoted by PA consultation to enhance behaviour change (Hughes & Mutrie, 2006).

Table 4.2: Practical application of components of the Transtheoretical Model during a physical activity consultation

Theoretical Component of TTM	Sub Component / PA Consultation Strategy	PA Consultation: Practical Application
Process of Change	<ul style="list-style-type: none"> Consciousness Raising Dramatic belief Environmental Re-evaluation Self Evaluation Social Liberation Counter Conditioning Helping Relationships Reinforcement Management Self Liberation Stimulus Control 	<ul style="list-style-type: none"> Providing information about benefits of PA and current PA guidelines. Discussing risks of inactivity Emphasise the social and environmental benefits of PA Review current activity status and assess value related to PA. Awareness of potential opportunities to be active and how acceptable and available they are to the individual. Substitute inactivity for more active options (e.g. taking stairs instead of lift) Seeking out friends, family and work colleagues who can provide support. Rewarding successful attempts at being active. Making commitments for activity (e.g. goal setting) Control situations that have a negative impact on PA, prevent relapse during these situations, stimuli to increase PA.
Decisional Balance		<ul style="list-style-type: none"> Ask individual to consider pros and cons of increasing activity pertinent to them. Using the decisional balance table. If there are more cons than pros as them to consider how to minimise some of the cons.
SE	<ul style="list-style-type: none"> Social Support Goal Setting Self-talk 	<ul style="list-style-type: none"> Determine with the person what kind of support they might need and who can provide it. Help the person set realistic and time phase goals from gradually increasing activity up to a level they have determines, get them to record these goals. Provide them with realistic opportunities for success and achievement. Help the person to recognise negative self-talk in relation to PA and help them to work on changing this to positive self-talk.
Relapse Prevention Model		<ul style="list-style-type: none"> Discuss how to prevent relapse from regular activity through discussing previous lapses and identifying high risk situations that can cause a lapse then help individual to find strategies to cope or avoid this situation.

Table 4.2 Adapted from Hughes and Mutrie (2006)

Enhancing processes of change

PA consultation provides a participant with explicit tools and techniques which are in line with the processes of change and proposes that these techniques are adopted in order to initiate and maintain behaviour change. Table 4.2 illustrates that the processes of change includes guidance which is interlinked and overlaps with the enhancement of decisional balance and SE. The relationship between processes and SE is complicated, it is not known whether there is an overlap between processes and an increase in SE, or whether processes are effective in enhancing SE. With this in mind, PA consultation guidelines also include specific reference to the SE and decisional balance components of TTM and provide strategies for enhancing PA behaviour through targeting these specifically.

Decisional balance

PA promotes discussion between the participant and practitioner about their perception of positive and negative aspects of PA and records these in a table. Depending on the balance of pros versus cons, the practitioner will encourage an individual to consider ways in which they can reduce or overcome some of the cons.

Enhancing self-efficacy

PA consultations seek to enhance an individual's SE and does so through employing a number of techniques, including social support, goal setting and positive self-talk.

Social support

PA consultation actively encourages social support as a means of increasing PA, generally through increasing SE (Loughlan & Mutrie, 1995). There is evidence to support the use of social support to help increase PA behaviour in adolescents (DiLorenzo, Stucky-Ropp, Vander Wal, & Gotham, 1998; Inchley et al., 2008). Social support is often referred to as a cultural or social correlate of PA, however PA consultation focuses on developing social support for PA. In relation to modeling (vicarious experiences), PA consultation encourages an individual to seek the support of a like-minded individual to provide support and inspiration for PA. In relation to verbal persuasion, individuals are encouraged to seek this from parents, peers and exercise leaders.

Goal-setting

Goal-setting is one of the most commonly used techniques in sport psychology and evidence supports its effectiveness in directing attention, increasing motivation, enhancing SE and enhancing performance (Locke & Latham, 1985). Although the evidence supporting its use in exercise psychology is limited, there is early evidence to support the use of goal-setting to increase PA in adolescent girls in an exercise environment (Dishman, Saunders, Felton, Ward, Dowda, & Pate, 2006). A review of goal-setting as a strategy for dietary and PA behaviour change, indicated that evidence for the use of goal-setting with adults is promising, but further research with adolescents is required (Shilts, Horowitz, & Townsend 2004). PA consultation guidelines (Loughlan & Mutrie, 1995) propose that an individual is provided with an opportunity to state their goals and then work with the researcher on developing short, intermediate and long term goals for increasing PA. They propose that the client is provided with a copy of the goals so that they can remind themselves of their target and so that progress can be measured at a future meeting.

Self-talk

It has been suggested that the key to cognitive control is self-talk (Zinsser, Bunker & Williams, 2001). It can be described as a form of self-persuasion and it has been identified as an appropriate tool for increasing SE (Hatzigeorgiadis, Zourbanos, Goltsios & Theodorakis, 2008). The positive effects of self-talk are well documented in sport psychology research, but less so in exercise psychology. Negative self-talk can cause negative emotions and can distract an individual from the task at hand. When this occurs, confidence in one's ability to complete a task (such as going to the gym) is replaced by doubt and emotionality, making the completion of the task less likely. The traditional guidelines for PA consultation (Loughlan and Mutrie, 1995) do not promote the development of self-talk in a consultation. However, it is anticipated, given the identification of verbal persuasion as a source of SE, that equipping individuals with the tools to stop negative self-talk and change it to positive self-talk may increase their SE to be active.

Relapse prevention model

A final component of PA consultations is underpinned by the relapse prevention model (RPM). This model was traditionally employed in addiction counselling (Arlatt & Gordon, 1985). Enhancing barriers SE is a central component of the relapse prevention

model, which focuses on helping individuals to develop coping skills to maintain their behaviour in the face of adversity. A PA consultation helps an individual to source strong social support and assists them in weighing up the pros and cons of PA in a more positive manner. Both of these are central to developing an individual's resilience when faced with difficulty in conducting exercise behaviour.

Awareness of stage of change and core counselling skills

PA consultation highlights that the approach adopted by a PA consultant needs to be tailored to individual needs. Research has shown that different strategies need to be employed in accordance to the stage of change an individual is in (Lowther, Mutrie, & Scott, 2007). Underpinning PA consultations is the adoption of key counselling skills by researchers and guidelines by Loughlan and Mutrie (1995) suggest that these include interpreting nonverbal behaviour and helping the client relax accordingly. They also propose that a researcher should display verbal skills which convey that they are listening and have empathy with the client.

4.5 Support for physical activity consultations

There have been a number of studies conducted that have supported the use of PA consultations when targeted at individuals identified as being in the stages of contemplation or preparation (Marshall & Biddle, 2001). Within the general population, Loughlan and Mutrie (1997) examined the impact of either a fitness assessment, PA consultation or information leaflet on PA behaviour. Results indicated that a PA consultation showed more promise for sustaining PA than the other forms of advice. Lowther, Mutrie and Scott (1999) adapted this study and examined effects on a longer term basis. Whilst PA increased for each group receiving some form of intervention (informational, fitness assessment and PA consultation) in the early stages of the programme, those receiving 'information only' had relapsed by six months. Whilst both intervention groups receiving some form of support maintained an increase in PA levels until six months, it was only the PA consultation group which showed sustained increased PA at 12 months. Lowther et al. (1999) suggest that such a finding supports the notion that cognitive-behavioural skills utilised in PA consultations may have the most effective long term effects for increasing PA.

Continuing on a similar theme, Lowther, Mutrie and Scott (2002) investigated the effectiveness of a PA consultation versus a fitness assessment in an economically deprived community. In line with the previous findings, results indicated that despite an initial increase in PA across all groups, only the group receiving a PA consultation intervention sustained this PA increase after 1 year. This study also reported that when provided with a choice of PA intervention, non-regularly active participants opted for a PA consultation over a fitness assessment. Further, these participants had a longer term adherence to the intervention than those who received a fitness assessment. An additional finding of this study was the sample had been identified as a hard-to-reach group, but findings reported contradicted this belief and reported that this group responded well to PA interventions. This provides support for PA consultations as a means to engage notoriously difficult populations in PA research.

Research relating to PA consultations has also been conducted within clinical populations. Kirk, Mutrie, MacIntyre, Miles and Fisher (2004) investigated the effectiveness of PA consultations in increasing PA in a sample with type 2 diabetes. Their study indicated that a PA consultation intervention was an effective means of increasing PA behaviour and stage of change for people with diabetes when compared to an exercise information leaflet.

Further PA consultation research has been conducted with cardiac rehabilitation patients (Hughes, Kirk, Mutrie, & MacIntyre, 2003; Hughes, Mutrie, & MacIntyre, 2007). Overall, results supported the use of PA consultations as a means of helping individuals to successfully maintain PA for 12 months after completion of a phase III exercise programme.

Finally, Mutrie, et al. (2007) examined the effectiveness of a PA consultation in a group setting on women suffering from breast cancer. They implemented a 12 week supervised exercise programme and results showed promise for promoting PA to women with breast cancer. Whilst this study was not as explicit in its reference to PA consultation, it supported the notion of supervised exercise support groups as a way of providing functional and psychological benefits to these patients, and promoted the future inclusion of such groups in cancer rehabilitation services.

Despite the strong evidence supporting PA consultation as a means for increasing PA, this research has focused around large scale randomised control trials in adult and clinical populations. To date, there has been limited research relating to PA consultation in the general population and no PA consultation research conducted with the female adolescent population.

Physical activity counselling and adolescent girls

Despite the lack of evidence specific to PA consultations, there is evidence to support behaviour change counselling in a variety of health care settings (Breckon et al., 2008) and PA counselling as an effective health promotion strategy is generally accepted. For example, in their systematic review of PA interventions, Khan and colleagues (Khan, Ramsey, Brownsen et al., 2002) reported evidence supporting the effectiveness of PA counselling for promoting PA in the general population.

In relation to adolescents, in a recent NICE report on promoting PA in adolescent girls (NICE, 2008), there was some evidence to support the use of counselling interventions in adolescent girls. However, there was no evidence for the support of counselling with this population within the UK. The review, conducted by Biddle and colleagues (NICE, 2008), included a study conducted by Metzker (1999), who found that an 8 week PA counselling intervention targeted at older adolescent girls (>14 years) was successful in increasing PA behaviour in adolescents (n=57). They implemented 5-10 minute small group or individual sessions, based on the TTM in a school setting. Both PA and stage of change had increased at follow up. However, the research quality rating assigned to this study by Biddle was low and the intervention was criticised for being only 8 weeks in length. Two additional counselling interventions reported in the review did not show any intervention effects on any variables. Robbins, Gretbeck Kazanis and Pender (2006) targeted younger adolescent girls (<15 years) (n=32) through a 12 week mediated computer intervention followed by a 10 minute session with a school nurse. Patrick et al (2006) used primary care providers to deliver a 5-10 minute face-to-face consultation to adolescent girls (n=438) followed up with telephone counselling for a year. There was no significant impact of the intervention on either objective or self-reported measures of PA. In general the support for counseling based interventions in this population is weak, however, further examination is required to provide more conclusive results.

Additional support for examining the potential effectiveness of counselling based PA interventions in adolescent girls comes from Nicholson (2009), who explored the relevance and usefulness of consulting with adolescent girls on PA. Focus group research conducted with Scottish secondary school girls identified that girls felt it was important to be listened to and to have greater dialogue with researchers about their PA requirements. Indeed, it emerged that participants wanted to have ‘proper conversations’ with teachers and felt that teachers should be trained to ‘listen’ to pupils. With this in mind, PA consultation could be an effective means of providing girls with the face-to-face verbal interaction they think is important. Nonetheless, to date there is no support for the use of PA consultations with adolescent girls.

4.6 Delivery and reporting of physical activity interventions

Despite this positive support for the use of PA counselling as a potentially effective tool for promoting PA behaviour, it has been suggested that there is a lack of clarity in relation to the exact nature and delivery of PA counselling approaches. In their systematic review of counselling based PA interventions, Breckon and colleagues (Breckon, Johnston, & Hutchison, 2008) highlighted that most interventions focused on outcomes rather than intervention processes, thus making treatment fidelity a concern. For example, the PACE+ multi component intervention for nutrition and PA change (Patrick, Sallis, Prochaska et al., 2001) includes a counselling element, but details regarding the nature of the counselling was lacking, as was analysis of this component of the programme in isolation to other elements.

Despite evidence supporting PA consultations as a promising means for developing PA and correlates of PA, and the acknowledgement that PA consultation guidelines produced by Loughlan and Mutrie (1995) are valuable, it has been suggested that since then interventions employing these principles have perhaps conceded on the original guidelines, with many studies failing to provide a description of the intervention and their adherence to guidelines (Breckon, Hally, Johnston, & Hutchison, 2008). Breckon et al.’s review further highlights that details relating to PA outcome, PA counselling content, technique, and patient readiness and receptiveness to the intervention, are factors regularly absent. A further criticism of many counselling based interventions is that they fail to highlight the theoretical basis of the intervention and the techniques and tools employed. In line with this, there has been a call for researchers to detail the exact nature

of any counselling conducted during an intervention (Breckon et al., 2008). Accordingly, the behaviour change consortium (BCC) (Bellg, Borrelli, Resnick et al., 2004) developed a treatment fidelity framework with 5 components of treatment fidelity and their application to a PA counselling intervention; design, training, delivery, receipt and enactment. These 5 components were given consideration in the development, implementation and evaluation in the current study.

4.7 Implementing physical activity consultations in a school environment

The systematic review conducted by Breckon et al. (2008) suggests that, despite being the gold standard in terms of research, randomised controlled trials can be criticised as they sometimes do not provide a true reflection of the community settings in which PA interventions tend to be delivered. In order to address this, and in line with action research the current study seeks to assess the feasibility and effectiveness of implementing a PA consultation intervention within a Scottish secondary school setting.

In 2010, a new curriculum; ‘The curriculum for excellence’ was implemented into all Scottish schools. A key component of the curriculum is that of Health and Wellbeing. It is proposed that this element of the curriculum will “*target experiences and outcomes for personal and social development, understanding of health, PE and physical activity...*” Moreover, a learning outcome of health and wellbeing is that it “*promotes confidence, independent thinking, positive attitudes and dispositions*” (www.ltsscotland.org.com). It is anticipated that PA consultation could be an appropriate means of targeting several of these learning outcomes as well as increasing correlates of and PA levels in adolescent girls. Further, in a time of economic uncertainty and cuts in public spending, PA consultations provides an opportunity for a PA intervention which is relatively cheap to deliver, which does not rely on specialized equipment and can be used with all population groups (Loughlan & Mutrie, 1995).

4.8 Rationale and study aims

An overview of PA consultations and the SCT based health promotion model has identified that PA consultations are a potential avenue for enhancing PA and psychosocial correlates of PA. Further, reviewing PA consultation literature has identified that there is limited knowledge relating to their use with adolescent girls. Accordingly, this

study conducted a randomised control trial investigating the use of PA consultations with adolescent girls aged 13-16 (S3), who were identified as contemplators and preparers, in Edinburgh, Scotland. The primary aim of the study was to evaluate the effectiveness and feasibility of PA consultations for use with a larger sample of adolescent girls in the final intervention (Chapter 7). In line with this, two sub aims were posited:

- To evaluate the effectiveness of the intervention on key psycho-social correlates of PA and PA behaviour.
- To assess the feasibility of the intervention through a pupil validity questionnaire and researcher case notes.

4.9 Methodology

4.9.1 Participants

Permission to conduct the study was received from the University Ethics Committee, the local authority, head teacher and head of the PE department. Participants (n=95) age 13-15 from a local secondary school were invited to participate in the first component of the study (i.e., completion of a stage of change question). During this time, the researcher met with the pupils during PE to give an overview of the study and its requirements, and distributed a PA question (Appendix B) to all pupils willing to take part. Pupils identified in the contemplation and preparation stage of change (n=62) were then given an information sheet and consent form, (Appendix C) to be signed by the girls and their parents. Of the 62 consent forms distributed, 21 were returned, a response rate of nearly 33.9%.

The baseline questionnaire was completed by 21 participants (Appendix D) aged 13-15. Following this, participants were allocated at random into either the experimental group (PA consultation) (n=12) or control group (n=9). Random allocation was carried out by an independent researcher. A full study profile is presented in figure 4.2 (in the results section).

4.9.2 Instruments

Measurement

Aim 1: Physical activity and psycho-social correlates of PA

The study aimed to evaluate the effectiveness of the intervention on PA behaviour and key psycho-social correlates of PA. These correlates were measured by a questionnaire devised by the researcher using previously published instruments (Appendix D). Internal reliability on each of the measurements was conducted and a Cronbach's alpha score of at least 0.7 was reported for each measure. Table 4.3 outlines the variables measured and the references for validation of use of these measurements with the adolescent population.

Table 4.3: Outcome variables and references for validation in Study 1

Variable	Reference or validation of reference
PA(3day recall)	Motl, Dishman, Ward, Saunders, Dowda, Pate (2007) & Stanley, Boshoff & Dollman (2007)
Stage of change	Prochaska, Donovan, D'Arcy, Holman & Giles Corti (1998)
SE for PA	Garcia, Pender Antonakos & Romis, (1998) McAuley & Muhlko (In Duda, 1998)
Self-regulatory SE	McAuley & Muhlko (in Duda) Measuring Exercise Related SE . i.e from guidelines produced by Bandura (1977)
Outcome Expectancies/Decisional Balance	Marcus and Owen (1992)

PA was assessed using the 3-day PA recall which has been validated for use with adolescent girls (Motl et al, 2007; Stanley et al. 2007). This self-report instrument is based on the Previous Day PA Recall (PDPAR) and was developed to capture habitual PA of adolescents. The instrument uses a time-based recall approach over a three day period. Each day is divided into 30 minute blocks of time from 7.00am to midnight. Participants are asked to record the specific activity they were conducting during each time block and accordingly the intensity of each activity. A numeric activity code represents 59 common activities (i.e. walking, swimming, homework). PA is then calculated using the metabolic equivalent (MET) levels. It is suggested that the questionnaire should take 30-45 minutes for completion and is thus recommended for use in a school environment.

Stage of change was assessed using the questionnaire developed by Prochaska et al. (1998). Participants were asked to identify which one of 5 statements related most closely to the extent they were achieving current PA recommendations (60 minutes PA on all or most days of the week).

The 4-item SE scale for exercise was developed from Garcia et al. (1998) and McAuley and Muhlko (1998). Participants responded on a scale of 0 (no confidence at all) to 10 (completely confident) the extent to which they believed they could be active for 60 minutes on a set number of days per week, up to every day.

An 8-item measurement scale for examining self-regulatory SE for PA was developed in line with McAuley and Muhlko (1998) and from the guidelines produced by Bandura (1977). Participants identified the extent to which they believed they could be active when faced with adversity on a 4 point scale (from very true to not very true): An example item was: “To what extent do you believe you could be physically active if you were tired”.

Marcus and Owen’s (1992) Decisional Balance questionnaire was used to assess participants’ perceptions of pros and cons of PA and relates to the outcome expectancies component of the PA consultation. Three items related to pros of PA (e.g., “I would be healthier if I was more physically active.”) and three items related to the cons of PA (e.g., ‘I would feel that I was wasting my time if I was more physically active’). The total score for cons of PA was then subtracted from the total score for pros of PA in order to give a total score.

Aim 2: Feasibility and processes of the intervention

Pupil validity questionnaire

An assessment of social validity was adopted as an additional means of evaluating the current intervention. Proponents of social validity assessment propose that clients are the best judges of the effects, acceptability and viability of an intervention programme (Shwartz & Baer 1991). In the current study the clients are the participants and so a pupil validity questionnaire is perhaps a better description of the measurement tool. It is thought to be important to evaluate the responses of the participants to the intervention because if they are dissatisfied with the ‘service’ they are receiving then they are unlikely to adhere to a programme and an intervention is unlikely to have the desired impact (Bull, 1991). Further, it has been suggested that social validity can be invaluable in facilitating

intervention improvement (Schwartz & Baer, 1991) and as the current intervention seeks to inform a future intervention, it is deemed an appropriate evaluation tool. Finally, it is thought that canvassing participants for their opinions on a given intervention will strengthen relationships between participants and the program, potentially increasing participants' sense of shared control (Lebow, 1982).

Social validity is used to supplement primary dependent measures of behaviour change rather than as a stand-alone measure (Pierce & Epling, 1980; Schwartz & Baer, 1991). Social validity refers to evaluative feedback from consumers and the current questionnaire was developed in line with Wolf's (1978) criteria for assessing social validity, and with guidance from Schwartz and Baer (1991). Consequently, three key areas of satisfaction were assessed: Firstly, were the goals important and relevant to the desired life-style changes; secondly, were the techniques and methods employed acceptable to the client and finally, were the clients satisfied with the outcome. In line with this, a social validity questionnaire (with nine open ended questions and nine Likert scale questions) was developed (Appendix E). This measure was included in the pupil validity questionnaire to provide some further clarification and validation of pupil responses to the intervention.

Case notes

In order to provide further assessment of the processes and feasibility of the intervention, the case notes maintained by the researcher were reviewed to consider the issues of staff buy-in, pupil buy-in, consultation content and format, facilities and delivery issues and reporting and measurement issues.

4.9.3 Procedure

Researcher training

In line with BCC treatment fidelity guidelines (2002) it is appropriate to detail training conducted by the researcher. The researcher attended a two day NHS Scotland PA consultation course (Hughes & Mutrie, 2008) during which she was educated about the theoretical underpinnings of the PA consultation intervention and developed the skills necessary to deliver a PA consultation. In addition to PA consultation training, the researcher also successfully completed a COSTCA introductory course to counselling and BASES sport and exercise scientist training, prior to delivering the intervention.

The researcher piloted the PA consultations on two adolescent girls, these consultations were recorded and subsequently analysed by a sport and exercise psychologist using the evaluation checklists (Hughes & Mutrie, 2008) to ensure adherence the PA consultation principles and framework. Feedback was given to the researcher and no major changes to the delivery of the consultation had to be made. The researcher was reminded to allow the participant plenty of time to respond and not to fill silences in conversation. During the intervention period, a further 2 random consultations were also analysed by an independent sport and exercise psychologist. The consultations were delivered at a highly satisfactory level and it was confirmed that a PA consultation had taken place.

Delivery of intervention

The experimental group completed a questionnaire at baseline (Appendix D). Each participant received an initial 45-55 minute consultation. This was slightly longer than in the guidelines but was felt appropriate for the population. Each consultation was carried out in the school environment, in a private room with a glass paneled door. PA consultations were conducted in line with exercise consultation training. Each technique or tool developed with participants had a strong theoretical underpinning (table 4.2).

The consultation firstly discussed with the participant what constituted PA and discussed current PA guidelines. The researcher and participant then discussed the participants' current PA level in relation to these recommendations. The notion of PA intensity was introduced to the participants and discussion around this topic was conducted. Participants were then encouraged to discuss past and present PA behaviours and discuss aspects of PA they liked and disliked. Pros and cons of PA were then discussed and participants were actively encouraged to provide solutions to potential barriers of PA. Following this, participants discussed how much more PA they would need to do to meet PA recommendations and talked with the researcher about their SE in relation to reaching these recommendations. The participant was then guided through a number of ways in which they could potentially increase their PA, they were asked to think about activities they would consider taking part in and they were encouraged to draw on past experiences. Following this, the researcher provided participants with a brief overview of effective goal-setting and from this, pupils developed PA goals to try to achieve over two weeks. Finally, pupils identified sources of social support that would be able to assist and support them with their PA plan. Participants were provided with a printed PA consultation pack

(Appendix Fi) which was completed in line with the discussion that took place during the consultation period.

After three weeks, the researcher met with participants to reinforce the advice given and opportunities identified in the first meeting. The second meeting provided an opportunity for the participant to discuss any difficulties she had had so far, to re-set goals as necessary and to ask any questions that they may have had. More specifically, pupils reported situations that prevented them from being active and discussed ways of overcoming these barriers. The researcher also provided the pupils with guidance on how to develop their positive self-talk. Pupils were provided with a second handout (Appendix Fii) which detailed the aforementioned tasks, but also included information on ways to increase their PA, opportunities for PA in their area and hints and tips on preventing a lapse. Pupils were encouraged to adapt their PA plan accordingly. These meetings lasted between 25 and 40 minutes.

After six weeks, the researcher contacted the experimental group via laminated wallet-sized reminder cards (delivered by the PE teacher to pupils during PE). This exercise sought to positively reinforce messages delivered during the consultations (Appendix G).

At week eight, the researcher met with the experimental group and they were asked to repeat the baseline questionnaire and a pupil validity questionnaire (Appendices D & E).

Prior to the intervention, the control group was asked to complete a baseline questionnaire (Appendix D). The researcher met with the control group again at week eight where they repeated the baseline questionnaire. There was no other contact with the control population.

4.9.4 Analysis

Aim 1- Physical activity and psycho-social correlates of physical activity

Stage of Change

Stage of change pre and post intervention was calculated through chi-square analysis. No significant difference between the experimental and control group was observed at baseline.

Other variables

An independent t-test was carried out on all variables at baseline to identify any significant differences between the groups. In order to determine that the data fulfilled the requirements of parametric testing, all data were checked for normality (skewness and kurtosis) and equality of variances and assumptions of normality

In order to determine pre and post intervention differences between the control and experimental groups, repeated measure 2 (groups) x 2 (time) ANOVA's were undertaken for each of the dependent variables. Where appropriate, post-hoc analysis was undertaken by conducting an independent samples t-test on the calculated difference score from pre to post-intervention

Aim 2- Feasibility and processes of the intervention

Pupil validity questionnaire

The open-ended responses to the pupil validity questionnaire were organized into the three main components of social validity; goals, procedures and outcomes and were then analysed by two researchers using deductive content analysis. Individual responses were then broken down into meaning units and presented for discussion. The total mean score and standard deviation for each likert question is presented.

Researcher case notes

Researcher case notes were inductively organised according to meaning in relation to staff buy-in, pupil buy-in, consultation content and format, facilities and delivery issues and reporting and measurement issues. Notes were discussed with the secondary researcher in order to clarify meaning and reduce reporting bias. Notes are presented as diary excerpts in a similar format to the open-ended responses in the pupil validity questionnaire.

4.10 Results

Figure 4.4 is a study profile which illustrates that all participants in the experimental condition took part in all aspects of the intervention and completed pre and post-intervention questionnaires. One participant in the control condition was not included in the final analysis as they were absent on the day the post-intervention questionnaire was delivered.

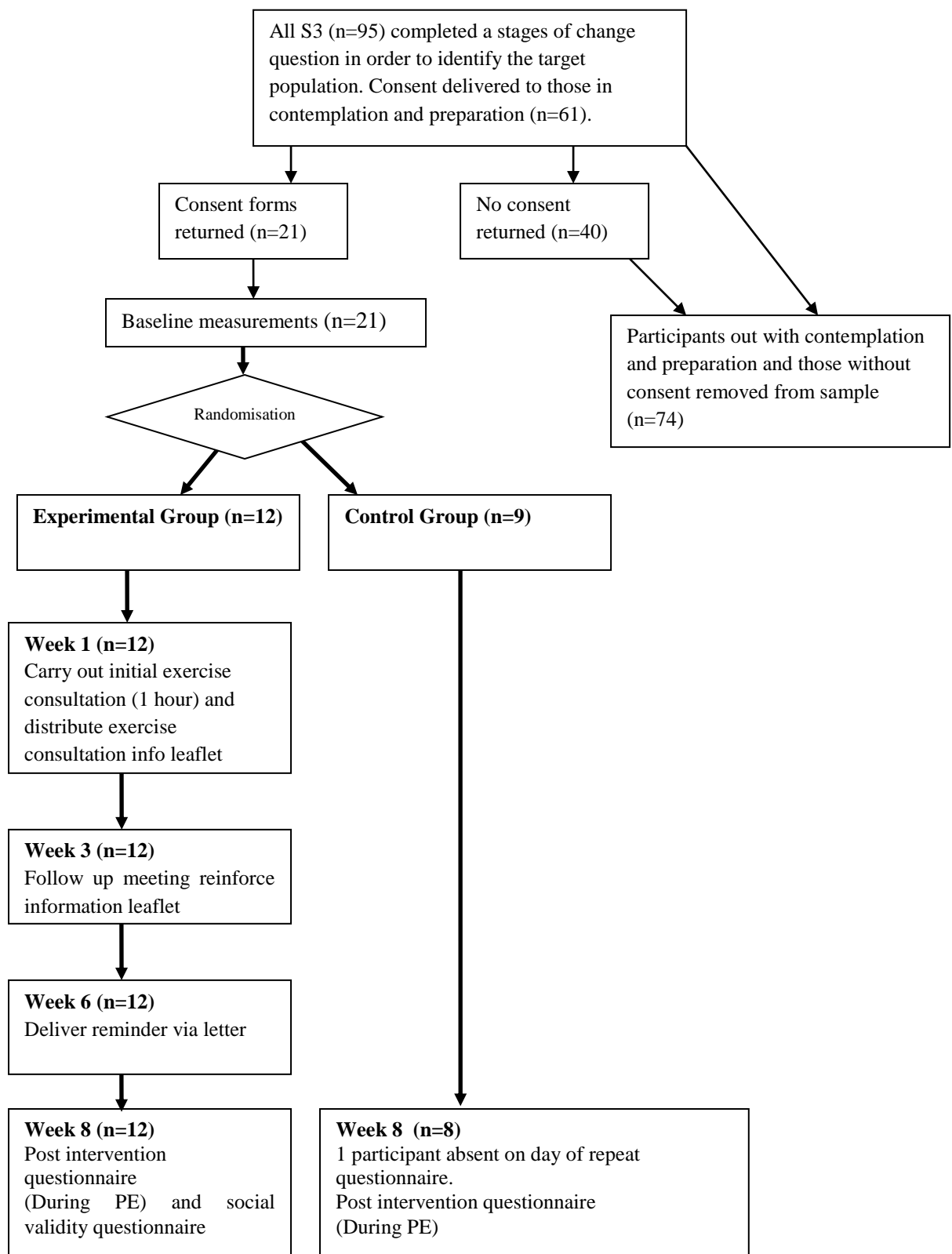


Figure 4.4: Profile of Study 1

4.10.1 Aim 1: Effects on physical activity and psycho-social correlates of physical activity

Table 4.4 illustrates the proportion of participants in each stage of change, pre and post intervention.

Table 4.4: Proportion of participants in each stage of behaviour change, pre and post intervention (Experimental and Control Group)

Stage	Pre		Post	
	Experimental (n=9)	Control (n=12)	Experimental (n=9)	Control n=(12)
Pre-contemplation	0	0	0	0
Contemplation	25%	11.1%	0%	11.1%
Preparation	75%	77.8%	50%	88.9%
Action	0	11.1%	50%	0%
Maintenance	0	0	0	0

Stage of change

Chi square analysis indicated no significant difference between the experimental and control group at baseline ($X^2 = 1.86$, $df=2$, $p>0.05$), but a significant interaction post intervention ($X^2 = 7$, $df=2$, $p<0.05$).

Additional Analysis

Table 4.5 illustrates the mean data and standard deviations for each of the measurements: stage of change, PA, self-regulatory SE, SE and decisional balance. An independent t-test conducted at baseline indicated there were no significant differences on any of the measurements between conditions indicating that randomization had been successful.

Table 4.5: Mean Data and Standard Deviations of Key Measurements in Study 1

Measurement	Group	Pre	Post
PA(<i>normal</i>)	Control (n=8)	28.43 (4.63)	30.08 (6.93)
(MET sum of a 30 min block)	Experimental (n=12)	28.22 (4.52)	30.86 (5.54)
Self-Regulatory SE	Control (n=8)	2.58 (0.41)	2.64 (0.46)
(maximum score = 4)	Experimental (n=12)	2.71 (0.50)	2.60 (0.54)
SE	Control (n=8)	4.56 (2.04)	4.53 (1.63)
(maximum score = 4)	Experimental (n=12)	5.46 (1.81)	6.10 (1.85)
Decisional Balance	Control (n=8)	4.13 (2.9)	2.50 (2.20)
(maximum score = 15)	Experimental (n=12)	3.92 (2.54)	3.25 (3.70)

There were no main effects of group or time and no significant interaction between group and time on the measurements of physical activity, self-regulatory SE, SE or decisional balance.

4.10.2 Aim 2: Evaluation of the processes and feasibility of the intervention

Pupil validity analysis

Comments made in relation to the three components of the social validity questionnaire (i.e., goals, procedures and outcomes) were deductively analysed and from this 11 first order themes and 4 second order themes emerged into the subthemes and then the overall theme. A summary of the themes is included in table 4.6. The results are presented in text format in accordance to these, quotes from the questionnaire responses are used to provide further meaning and pseudonyms are used to ensure pupil confidentiality. The data refer to the 12 questionnaires completed by participants in the experimental condition.

Table 4.6: Summary of themes emerging from a pupil validity questionnaire related to physical activity consultations

EXPERIENCE OF A PA CONSULTATION			
First order theme	Second order theme	Sub-theme	Overall Theme
Good delivery	Positive procedure	Procedure	Social Validity Assessment of an Exercise Consultation
Appropriate handout			
Good contact with researcher			
Needed more contact with researcher	Negative procedure		
Too focused on handout			
Intervention was worthwhile	Positive goals	Goals	
Good to be educated on PA			
Good that intervention was individualized			
Felt increased PA	Positive outcomes	Outcomes	
Felt increased confidence			
Would recommend to a friend			

Hierarchical structure of second order theme: Procedure

This theme emerged from participants' comments relating to the procedural aspects of the PA consultation and refers to the techniques employed by the researcher to deliver the consultation and includes aspects such as timing, content and handout quality.

Positive comments regarding the procedure

This theme related to positive comments about the procedure adopted for the consultations. In general, there was a positive response to the way in which the consultations were delivered and the format of the handout used. For example, Jade reported: "I think it was well delivered and I understood exactly what to do. I also liked how the teacher did not make you feel embarrassed or singled out." For Jade, having an understanding of the material and feeling comfortable in the consultation was important. Similarly, Ruth reported positively on the consultations: "Yes, because she didn't use big technical words and was very friendly. The handouts were good because they gave a lot

of information.” For Ruth, it was useful that the researcher used common language and was friendly towards her; she also felt that the handouts provided her with information. Also in relation to the handout, Annabelle reported that she found the handout useful: “Yes I did, because after the meetings I would sometimes forget what Joan had said but there was always the handout to look back on to remind myself.” For Annabelle, the handout was a useful way to reinforce the messages delivered during the consultation. In relation to the amount of exposure pupils had with the researcher, the majority of pupils felt that the level of contact they had through the meetings and handout was sufficient.

Negative procedure:

This theme emerged from any negative comments relating to the procedural aspects of the consultations. In general, there were few negative comments. However, some pupils, such as Rachel, felt that it would have been useful to have access to the researcher outside of the consultation times: “It would have been nice to know where I could contact her to talk to her about the booklet etc.” This was echoed by Kim who felt that it would be good to see the researcher outside of the formal meetings. With regard to the handout, Amy felt that she would have preferred more discussion rather than working so much from the handout: “Too much from the booklet- it would have been nice to just look over it and then chat about physical activity.” For Amy, having more general discussion would have been more appropriate.

Second order theme: Goals

This theme emerged from pupils comments relating to the behaviours targeted for change and in this instance it was important to evaluate if the pupils felt that the goals of the intervention were important to them. There were no negative comments reported about the goals of the consultation. When participants were asked if the time spent taking part in the PA meetings was worthwhile all participants reported that they felt it was. Pupils such as Anne explained why she felt this way: “Yes, it made you feel good about yourself, as it makes you want to become more active.” This was similar to Katie who explained why she felt they were worthwhile: “The PA meetings were worthwhile because it gave me confidence in all sorts of ways.” For both Katie and Anne, feelings associated with the consultation were deemed positive.

With regard to PA, some pupils, such as Lucy, felt that being educated about the intensity of PA required for health benefits was important: “Yes, it focused on intensity which was

something I needed help in”. Further, focusing on individual needs was appreciated by others, such as Louise:

Yes, because it did help me to be more active now I walk a bit more when I’m going to the bus stop or walking back from school. I think the meetings helped me get fitter without having to join any clubs as I explained to the teacher and she found out ways to fit more hard activity into my everyday life.

Individualising the programme and helping pupils to focus on activities they enjoy was also seen as a positive component of the consultations by Jude:

Yes, the meetings really focused on areas of importance to me, e.g. thinking of different activities that I liked to do at school but that I wasn’t doing any other time so that I could maybe start doing them more than just in PE.

Overall, the goals targeted in the PA consultations were perceived as meaningful to the participants and this can be reported as a positive aspect of the intervention.

Hierarchical structure of second order theme: Outcome

This theme can be defined as pupils’ satisfaction with the outcome of the intervention and in this case refers to changes in PA behaviour or correlates of PA, such as SE. As with the goals of the intervention, all pupils reported that they were satisfied with the outcomes of the intervention, as illustrated by Kate’s comment: “I was happy with the results of the meeting because, even though I’m not in any of the after school clubs, I could do walking by myself and the teacher gave me the confidence.” A feeling of increased PA and being well supported was also shared by Lucy: “Yes, I became more active and had the support I needed to do it. Also I was given lots of useful information.” Further, many pupils reported that they would either recommend the consultations to a friend or would take part in the consultations again: “Yes I would because it really helps boost your PA and makes you feel really good about yourself.” Overall, participants were positive about the outcome of the PA consultation

Likert scale

Table 4.7 illustrates the mean data for each of the Likert questions included in the questionnaire. The scale used was from 1 (Not at all) to 7 (Very Much). The table

illustrates that for each social validity level, participants showed a high level of satisfaction for the PA consultations.

Table 4.7: Mean scores and standard deviations for the Likert scale responses associated with a physical activity consultation (on a scale of 1 – 7)

Social Validity Level and Question	Mean	Standard Deviation
Procedure: <i>I felt I understood the material that was being presented</i>	6.58	0.90
Procedure: <i>Did you get the kind of service you wanted?</i>	6.25	0.75
Procedure: <i>Overall, how satisfied were you with the meetings?</i>	6.50	0.52
Procedure: <i>Did you find the meetings enjoyable?</i>	6.25	0.87
Procedure: <i>Joan used examples and activities that were appropriate to me and my PA</i>	6.58	0.67
Goals: <i>The goals I set with Joan were appropriate for me</i>	6.67	0.50
Outcome: <i>Did you find the meetings useful?</i>	6.83	0.40
Outcome: <i>I intend to use the information from the meetings in the future</i>	6.25	0.75
Outcome: <i>I used the information out of school/the meetings</i>	6.33	0.78

Case notes

Case notes are presented as excerpts from the primary researcher's reflective diary in relation to the delivery of the intervention and the feasibility of the study for a larger scale intervention. The notes have been organised and presented around four main themes: pupil buy-in, staff buy-in, content and format of the consultation, and facilities and delivery issues.

Pupil buy-in

The researcher made notes relating to the pupils general responses to the intervention and the extent to which she felt they 'bought in' to the process. There were several comments which reported that the researcher felt that she was receiving a positive reaction from participants, as highlighted by the following excerpt: "I feel that pupils were enjoying the experience and pupils seem keen to open up and discuss the issues at hand." This suggests that there was buy-in from pupils and that they pupils were responding to the intervention appropriately. Further, the researcher noted pupils seeming enthusiastic at discussing the

arising issues: “A few people have commented that it is good to talk about PA as they never get a chance to discuss it with anyone.” This indicates that simply discussing PA appeared to be a positive experience for some pupils. However, the researcher did highlight that it was difficult to be completely confident in pupils’ comments relating to goals:

A slight concern in any relationship is that the participant is trying to please the researcher and so there is reporting bias associated with this. I think the girls are telling me the truth and are responding well, but there is no certain way of knowing this.

A further finding highlighted that sometimes pupils found it hard to concentrate near the end of the consultation “Pupils seemed restless nearing the end of a consultation especially if the bell had gone for another class or for break time.” The ability of pupils to remain focused when the consultation ran into another class or break time is something that requires further consideration, especially given that such distractions may always be evident within the school environment.

Pupils also divulged information of a sensitive nature during the consultation process: “Today a pupil reported some information of a sensitive nature, I was glad I had discussed the potential for this to happen with my supervisors and had been trained in child protection and so was able to take appropriate action.” The researcher reported that it was important to be aware of school protocol for reporting this information and to direct the pupil to sources of support. In relation to pupil buy-in, this finding suggests that pupils were comfortable enough in the setting to divulge such information.

Staff buy-in

Notes were made in relation to the attitudes and involvement of staff in the intervention. It was noted that the staff were not particularly involved in the process, but were interested in what was happening and assisted wherever possible:

The staff have been really helpful with the logistics. In terms of input they have been asking what we do during a consultation, but I think they are just happy for me to get on with it rather than interested in learning to deliver them. I think it would be a big burden on them to deliver PA consultations in their current role.

Whilst the staff in school were accommodating and helpful, the researcher reflected that it is possibly out-with their remit to deliver the intervention. Nonetheless, there was a note made relating to the potential for PA consultations to fit within the curriculum: “I think there is potential for them (PA consultations) to fit well within the curriculum for excellence target of health and well-being. Perhaps a stronger link with active schools would be useful.” Whilst the researcher was unsure of who was best placed to deliver a PA consultation in a school environment, she reported that they complement the new school curriculum and may help schools hit their healthy schools targets. Further, it is suggested that working more closely with Active Schools could assist the delivery of the project.

Consultation content and format

The researcher reflected on the content and format of the PA consultation. She felt that at some points there was potentially too much information, as illustrated by the following excerpt:

There was a lot of information to discuss in the first consultation and perhaps some of this could be done in the follow up consultation so that the split is more even. For some pupils, the option to come back for a third meeting may be useful.

This quote identifies that the information presented to participants could be split more evenly between the two consultations and the offer of an additional consultation may be useful. The researcher also commented on the time requirements of PA consultation: “In terms of time, conducting the consultations is really time consuming and it would be difficult for one person to implement with any more participants.” It is suggested that in order for PA interventions to be implemented effectively, a large commitment from an appropriate member of staff is necessary and delivering at this intensity to any more participants would be difficult.

Processes of change

The researcher recorded notes on each of the practical tools employed in a PA consultation and how she felt pupils responded to these techniques. In relation to processes of change, the researcher recorded that many participants were not aware of current PA recommendations, their current PA or the risks associated with a lack of PA: “I am surprised at how few girls are aware of the PA recommendations. Not many girls

know how active they are and when I highlight the risks of inactivity the girls are really shocked.” In addition to this, participants were not fully aware that walking to and from school counts towards their PA count: “When I ask some girls how active they are, they say not at all. After some discussion, I discover they walk over 15 minutes to and from school each day.” Awareness of PA guidelines, what constitutes PA and the risks of inactivity appear to be central components to the PA consultations.

Counter conditioning, through replacing sedentary activities for more active options appeared to be popular with participants: “Girls were shocked at how much time they were being inactive, being on Facebook or MSN appeared to be largely responsible for this. They seemed keen to aim to give up some of this time for active time.” This quote highlights that the use of social networking was an activity which was taking up a lot of the girls’ time. However, the girls appeared willing to give up some of this sedentary time and set some PA goals.

Decisional balance

It was reported that there was a mixed response to the decisional balance discussion: “Some girls do not agree with the comments on the decisional balance questionnaire, for many the effort of PA and time it takes seems to constantly outweigh any benefits.” This highlights that PA is constantly competing with other activities and often girls do not see it as a priority.

Self-efficacy

Pupils seemed enthusiastic about the goal-setting activity: “The girls seem to respond well to the goal-setting task and appear to be motivated to try and achieve their goals.” In addition to goal setting, pupils enjoyed practicing developing their self-talk, but many were surprised at how difficult it was to do: “The girls commented that they enjoyed the self-talk exercise as it was something new. However, many commented that it was quite difficult to do and that they hadn’t noticed how negative they were before.” Self-talk appears to be an effective way to engage pupils and given the girls’ comments on negative self-talk, it appears a worthwhile exercise.

The researcher made notes on the social support aspect of the intervention. She noted that there was potential to involve the sources of social support (i.e. parents, peers, and teachers) into the intervention process: “A larger scale project may see more involvement

from parents and peers and get them involved and integrated into the intervention process. This was probably out-with the remit of the current study.” The researcher identified that it may have been useful to utilise sources of support, given this was a target of the intervention, but this would require further time investment.

Relapse prevention

The researcher reported that many participants reported positive results after their initial meeting: “Many of the girls reported that they felt confident about increasing their PA after the initial meeting and felt that they had done well in achieving their initial goals.” However, despite this, participants did report some challenges and there were positive comments related to discussing with them how to cope better or avoid these situations: “Jude reported that it was good to know that she would know what to do if she missed a PA session- fit it in another day rather than miss is out altogether!” This example highlights that participants felt more equipped to deal with barriers after a PA consultation.

Facilities and delivery issues

Issues relating to the facilities available and any delivery concerns were recorded by the researcher. Sometimes there was a problem getting access to a classroom despite planning and booking rooms in advance as was highlighted in the following diary section:

Today I arrived at my allocated classroom and there was an exam taking place in it. I had to spend time chasing around to find another room. The staffs were helpful, but I didn’t like taking up their time. I think getting access to space more often than I am already could be difficult.

The researcher felt that whilst the school were very accommodating, the physical space available to conduct a consultation was limited and this required consideration when possibly increasing the number of pupils receiving a consultation.

Reporting and measurement issues

The researcher recorded notes on any reporting and measurement issues faced when delivering the PA consultations. The researcher reflected on a couple of issues related to outcome measures:

It would be helpful perhaps to have a monitor of sedentary time versus active time. Further, a lot of pupils reported walking as their main activity, more insight into the actual benefits of walking and walking guidelines for this population would be helpful. It was unclear how accurately pupils were reporting their intensity levels.

It was noted that further access to additional information relating to sedentary activities and the benefits of walking would benefit the consultation process: “Many pupils reported that they walk for PA, but guidelines surrounding the benefits for walking for health in this population are limited.” Further, a more reliable means of reporting intensity levels would be helpful: “I am not sure how consistent the girls are in reporting their intensity levels. I am not sure if what is a 15 on the scale for one girl is the same for another.”

4.11 Discussion

It has been suggested that counselling based interventions can provide an effective way of enhancing PA and other positive health behaviours (Breckon et al., 2008). One such approach, PA consultation (Loughlan & Mutrie, 1995), a person centred approach to developing PA behaviour, has been identified as effective for use with both general and clinical adult populations (Kirk et al., 2004; Loughlan & Mutrie, 1997; Lowther et al., 1999). Despite the positive results associated with counselling based interventions and PA consultations, their use with adolescent girls has thus far been inconclusive (NICE, 2008). Further, it has been highlighted that the use of PA consultations to enhance PA behaviour in adolescent girls (an at risk group) has not been reported. Accordingly, the current study aimed to evaluate a small-scale PA consultation intervention targeted at adolescent girls. In order to do so, the study assessed the effectiveness of the intervention on PA and psycho-social correlates of PA and explored the feasibility of implementing the intervention with the current population of interest in a school environment. The findings of the current study are now discussed in relation to contemporary literature and with a view to informing the final study in the current thesis.

4.11.1 Physical activity and psycho-social correlates

The study delivered a PA consultation to those in the experimental condition whilst those in the control group received no intervention. It was reported that participants in the

experimental condition significantly increased their score on stage of change measure as compared to the control group. This indicated that the PA consultations resulted in participants moving through the stages of change. Previous research, focused on counselling based interventions targeted at the same population (Metker, 1999), highlighted that stage of change had increased at follow up, something reflected in the current study. Movement through stages of changes is particularly important as it is associated with a positive change in individuals' behaviour and motivation (Wallace, Buckworth, Kirby & Sherman, 2000). Accordingly, this finding goes some way to supporting the use of PA consultation as a means to help adolescent girls move through the stages of change and highlights the need for this relationship to be examined in more detail in future larger scale interventions.

The quantitative results indicated that the intervention was not effective at increasing PA levels. This finding suggests that PA consultations were not effective in increasing the PA of this group. It is surprising that there was no significant increase in PA levels, given the significant rise in stage of change score for the experimental group. Traditionally, stage of change is linked with an increase in positive health behaviour. However, it could have been the case that individuals moved from contemplation into preparation which would not lead to an increase in PA, as individuals would simply be preparing to be more active, rather than embarking upon the action stage where they would be increasing their PA. However, further analysis revealed that this was the case for only one participant and so can not explain this finding. The findings in the current study are not in line with previous research conducted in relation to PA consultations (Loughlan & Mutrie, 1997; Lowther, Mutrie, & Scott, 2002) in the adult population. Both of these studies reported increases in PA and indeed, some long term adherence to PA. Further, previous counselling based interventions targeted within this population, as reported in NICE's 2008 review, reported an increase in PA behaviour after an 8 week PA counselling intervention (Metker, 1999). However, the findings in the current study are in line with those of Robbins et al (2006) and Patrick et al. (2006) who reported no significant effects on PA variables post counselling intervention.

Positive changes in decisional balance, SE and social support were also anticipated with the successful application of a PA consultation, but were not evident in the current study. Again, this is surprising given the increase in stage of change score as stages of change are generally associated with three mediators of change: Processes of change, decisional

balance and increased SE. Whilst the current study did not measure processes of change, there was no increase in either decisional balance or SE.

Decisional balance has been identified as a key component of the TTM and is a central process in a PA consultation and it is therefore surprising that there was no increase in this score. However, in a previous study (Nigg & Courneya, 1998) an increase in decisional balance score was most evident in the action stage and pros were more important in the latter stages of the model. It could be suggested that, as with the PA score, pupils had not reached the action and maintenance stages of the model where decisional balance is perhaps more influential. Indeed, further analysis indicated that only four of the 12 participants had reached the action stage of the model and none had reached maintenance. Nonetheless, it is thought that participants should have an increased understanding of the barriers and facilitators to PA, through a PA consultation, and this was not evident in the quantitative findings of the current study.

SE has been highlighted as one of the key correlates of PA (Loucaides et al., 2007; Trost et al., 2001) and a key component of the TTM (Prochaska & Velicer, 1997). The fact that SE did not progress in line with the increase in stage of change score is surprising as, traditionally levels of SE have increased in line with progression through stages of change (Prochaska & Marcus, 1994; Nigg & Courneya, 1997). Further, PA consultation specifically targets the key sources of SE through a number of different practical techniques and so the lack of progression is surprising.

One such technique employed to enhance SE is to develop strategies for increasing social support (Loughlan & Mutrie 1995). PA consultation encourages individuals to seek support from like-minded peers and parents and exercise leaders. Given there was no increase in SE or PA it is not surprising that there was no increase in social support score. However it is a notable finding as a PA consultation would hope to see an increase in this score.

Overall the results show that PA consultations were not effective in increasing PA or psycho-social correlates of PA, but were successful in increasing participants stage of change score. However, the sample size may have influenced findings and a key limitation of the current study was that participant numbers were low. As a result, there may have been insufficient power to detect significant changes in outcome variable.

Accordingly, a level of caution should be shown when interpreting the full implications of the reported results. Future research should aim to increase participant numbers in order to overcome such issues. However, it should be acknowledged that recruitment of participants was difficult and only 21 of 62 consent forms were returned to participate in the study, a response rate of 33.9%. There may be a number of reasons why girls do not volunteer for studies, but it was evident in this study that returning consent forms was an issue with pupils often reporting that they had forgotten to give them to parents or to have returned them to school. Future research may consider an 'opt out' system of recruitment to combat this issue. This approach to recruitment has been used frequently within the target population, with a high level of success (Sportscotland, 2007).

Additionally, all data were derived from self-report questionnaires, increasing the likelihood of reporting biases (Taber et al., 2009). However, all measurement tools adopted in the current study were thought to be appropriate and had been previously validated and used in similar research.

4.11.2 Processes and feasibility of the intervention

A systematic review of PA counselling interventions (Breckon et al., 2008) reported that none of the PA counselling interventions in the review addressed treatment fidelity issues. In particular, the link between theory and practice was not reported. The review highlighted that whilst the early guidelines of Loughlan and Mutrie (1995) provide a theoretical approach, details relating to client interactions are absent. Consequently, the review suggested that future research would do well to report on the processes involved in PA counselling, rather than simply on the outcomes of any intervention. Further, in their review of PA interventions for adolescents, Stone and colleagues (Stone, McKenzie, Welk, & Booth, 1998) suggested that future interventions targeted at this population would do well to be more descriptive in their account of intervention procedures and measurements to aid the replication of components of such interventions in the future. The current study followed the treatment fidelity guidelines produced by the BCC (Bellg, Borrelli, Resnick et al., 2004).

Pupil validity questionnaire

As a means to address treatment fidelity guidelines proposed by the BCC, the current study sought to assess the impact of the intervention from the pupils' perspective. It was

proposed that this was particularly pertinent, given that all previous research relating to PA consultations was focussed on the adult population, and as such it is possible that further adaptations to the consultations are required in order to be effective. Further, Mutrie, Campbell and Whyte (2007) reported a key weakness in their study with breast cancer patients, was that they did not identify which aspect of the group exercise experience provided the most benefit to individuals. As a result, it was difficult for them to assess if their intervention was effective because of the exercise itself, the group experience or both. Additionally, Lowther, Mutrie and Scott (2002) reported that they were unsure of the reasons as to why PA consultations had a positive impact on sedentary individuals. Accordingly, in line with social validity guidelines (Wolf, 1978, Schwartz & Baer 1991) a pupil validity questionnaire was used in order to examine pupils' views on the goals, processes and outcomes of the intervention and these views are now discussed.

Procedure

Pupils made both positive and negative comments relating to the procedures of a PA consultation, although it should be noted that positive comments far outweighed the negative. Positive comments relating to the procedure indicated that the information provided was appropriate, the booklet was useful and the researcher was friendly and approachable. Given that the first step in Bandura's model of health promotion (2005) is developing the informational mechanism (one's information on how to improve health behaviours), then it could be suggested that there is a gap in the Scottish curriculum in developing knowledge in relation to this subject and PA consultations may be an appropriate way of disseminating this knowledge.

Rapport with the researcher was highlighted as a positive aspect of the intervention. This could be important given that Loughlan and Mutrie (1995) highlighted that consultations are thought to be partly effective as they are delivered by consultants trained to help participants feel relaxed and as they also employ recognised psychological techniques targeted at increasing PA behaviour. This suggests that not only the content but also the manner, in which such an intervention is delivered, may have an impact on the consequent success of an intervention. Further, in relation to the needs of adolescent girls, Nicholson (2009) reported that adolescent girls felt that they needed to be listened to regarding their PA requirements. It appears that PA consultation, which provides girls with an opportunity to do this, was positively received by adolescent girls. Further, within sport psychology research there has been evidence to suggest that the level of rapport

between a practitioner and client can be the main influencing factor in the effectiveness of any programme delivered (Orlick & Partington, 1987; Ravizza, 1990). It is suggested that the relationship between researcher and client has equal importance in an exercise promotion setting and it is suggested that future research examines this notion in more detail.

Despite the mainly positive feedback relating to the procedural aspect of the PA consultation, there were some negative comments. Pupils reported that they would like more access to the researcher. Unlike counselling, PA consultations do not focus on the development of a long term relationship between a client and researcher (Loughlan & Mutrie, 1995). However, the target population may require slightly more support than older participants and perhaps the opportunity of a third consultation should be given consideration in a future intervention.

A further criticism of the PA consultations by one participant was that there was too much information provided in the handout. This view was not shared consistently, but raises two issues. Firstly, perhaps the researcher should be more aware of tailoring the approach and not relying so much on the booklet when a participant is willing to talk without the aid. Secondly, there was perhaps too much information in the booklet and consideration for modifying this in a future intervention should be given.

Goals

Pupils responded positively in relation to the goals of the intervention and there were no negative comments reported. Participants reported a focus on individual needs and the educational aspect of the intervention were positive and the feelings of increased activity and confidence made the intervention worthwhile. This finding is encouraging as it intimates that low active participants felt that the intervention was important to them. This finding is similar to that of Lowther et al. (2002), who reported that PA consultations were effective for use with hard-to-reach adult populations. Further, as with the procedural aspect, pupils reported that they enjoyed learning about PA and ways of increasing their PA. This suggests that whilst the informational aspect of Bandura's model (2005) (which develops understanding about PA) is proposed as the easiest mechanism to target, is perhaps not being delivered in Scottish schools.

Given the girls' positive response to the intervention and enthusiasm regarding increasing PA, it could be suggested that when the wider psycho-social aspects (i.e. issues of confidence, social support etc) of a PA intervention are targeted then a more positive response may be received than with a focus on PA alone. Traditionally, PE is only focussed on the activity in question and in particular skill acquisition and development (Tulloch, Fortier & Hogg 2000). The psycho-social aspects of PE and PA outside of school are not traditionally targeted as they are in a PA consultation (Annesi, 2006). This finding is in line with that of the Fit for Girls study (FFG), a large scale nationwide study exploring the experiences of adolescent girls in Scotland. Early focus group findings (Mitchell, 2010) highlighted that the wider psycho-social environment of the PE experience is perhaps more important than the PA itself, and this could have an impact on levels of participation and enjoyment. It could be suggested that the finding from FFG and the findings in the current study indicate that there is a more positive buy-in to PA from adolescent girls, when the wider psycho-social environment of PA is targeted.

Outcome

In relation to the outcome of the intervention, feedback suggests that the intervention was successful in helping participants to become more active and to increase their confidence in relation to PA. Whilst this finding is not in line with the quantitative findings presented in the current study, it is a promising finding and further supports the need for additional investigation into the use of PA consultations with this population. In relation to the studies presented in NICE's (2008) review, this supports Metzker (1999) who reported an increase in PA behaviour after a PA counselling intervention. However, it is in contrast to both Robbins et al. (2006) and Patrick et al. (2006), who reported no significant increases. Nonetheless, each study presented in the NICE review (2008) review was focussed on quantitative results and there is no known research to which the qualitative findings of the current study can be compared.

Finally, the Likert scale responses from the pupil validity questionnaire were extremely positive, with all questions receiving a score over 6 (whereby a score of 7 reflected a response of 'very much agree'). This indicates a positive buy-in from pupils in relation to the processes, goals and outcomes of the intervention and supports the notion of PA consultations as an effective means of targeting populations traditionally labelled as 'hard-to-reach' (Lowther et al., 2002).

The findings of the pupil validity questionnaire in the current study have illustrated that whilst there was limited success in terms of the outcome of the intervention, pupils responded well to the goals and procedures. Overall, the results of the pupil validity assessment were positive and it is proposed that positive features of the intervention should be considered in future interventions, whilst the negative aspects reported should be considered as improvements.

Case notes

Treatment fidelity guidelines indicate that attention should be given to five key areas when conducting a counselling based intervention; design, training, delivery, receipt and enactment (Breckon et al., 2009). Considering this, the primary researcher made a series of case notes reflecting on; pupil buy in, consultation content and format, facilities and delivery of the intervention. An important component of action research is reflection from the researcher and case notes played an important role in this function.

In relation to pupil 'buy-in', case notes were mainly positive and reflected the findings of the pupil validity questionnaire. Findings also suggest that pupils were enthusiastic and interested in discussing their PA behaviour and discovering ways to enhance it. The girls reported that they enjoyed simply talking about their PA and this suggests that there is a need within the curriculum for girls to discuss their health and wellbeing with a trained professional, something that is supported by Bandura's Health Promotion Model (2005). The fact that some pupils reported issues of a sensitive nature during the consultation indicates that there was a level of trust between the researcher and pupil and this is positive in terms of the delivery of the intervention. It further supports the aforementioned link between client and researcher rapport (Orlick & Partington, 1987) as well as findings by Lowther, Mutrie and Scott (2002) who supported the use of PA consultation with 'hard-to-reach' populations.

The researcher reported that staff in the current intervention were supportive in assisting the researcher, but were not involved in the processes. Further the researcher felt that given the high workload already placed on teaching staff, it would be difficult to involve the staff in any future consultations. Specifically, the consultations were time consuming and traditionally schools only focus on school based PA (Annesi, 2006), and PE teachers are normally tasked with teaching skill acquisition and development (Tulloch, Fortier, &

Hogg 2000). Therefore it is unclear if it is realistic for PA consultations to be delivered by PE teachers in the future.

The researcher made additional notes in relation to the potential role of PA consultations within The Curriculum for Excellence. Within schools, competing priorities may lead to some curricular subjects receiving less attention than other school subjects. The problem of conflicting and diverse aims of PE departments has been acknowledged worldwide (Fairclough & Stratton, 2005, Green, Smith, & Roberts, 2005). With respect to this, it has been suggested that lack of clarity in relation to the curriculum can account for some of the variations in PA levels during PE (Fairclough & Stratton, 2005) and this is worthy of consideration in future research. Nonetheless, as The Curriculum for Excellence identifies health and well being as a key outcome across the whole school, not just PE, it is possible that there will be further opportunity for whole school approaches to PA and this is something that would be a valuable area of investigation in whole school community interventions. Additionally, there is potential for PA consultations to fit within the new curriculum and this could be viewed as an important consideration for policy makers and course designers.

The current study did not conduct a cost effectiveness analysis, but given the only outlays were the researcher's time and printing costs, it is thought that consultations are a relatively cost effective means of implementing a PA intervention. This supports Lowther, et al's (2002) proposal that PA consultations are a relatively cheap intervention to implement and that they do not rely on specialist equipments or venues. It is suggested that future research would do well to conduct a cost effectiveness analysis on PA consultations in order to validate this suggestion.

The researcher reflected that the consultations could be adapted for future use with adolescent girls. It is suggested that information is disseminated more equally between the consultations and pupils have the opportunity to attend a further consultation if they feel it would be beneficial. Additionally, the researcher reflected on some issues related to the facilities and delivery aspect of the intervention. These findings highlight the difficulty of delivering a consultation on an individual basis to higher numbers. Further, it supports the notion of group based consultations.

Whilst the current study employed PA consultations on a one to one basis, research investigating the delivery of PA consultation via alternative modes is actively encouraged (Hughes & Mutrie, 2006). A group approach to PA consultation was used within a specialist population for women with early stage breast cancer (Mutrie, Campbell et al., 2007). A 12 week group exercise programme was delivered to participants and functional and psychological benefits were shown after both 12 weeks and six months. Further, qualitative data indicated that the group itself was an important aspect of the intervention. It is thus proposed that the appropriateness of the use of group PA consultations within another population is worthy of further enquiry. It is anticipated that this will lead to an increase in participant numbers and consequently may lead to an improvement in study design, as more participants would help increase the statistical power of the analysis.

The researcher also highlighted that girls' knowledge in relation to PA and PA guidelines was limited, strengthening the need for such information to be incorporated into the curriculum. This finding is in line with FFG (Inchley, Mitchell & Currie, 2010) who reported that only 19% of girls correctly state the current PA recommendation for young people their age.

A further concern highlighted in case notes was girls' comments relating to the time they spent on social networking sites (e.g. Facebook). The HSBC health survey (Currie et al., 2011) indicated that 55% of girls use a computer for chatting on-line, internet, email and homework for at least two hours every day of the school week. This is compared to 46% of boys and the use of computers for activities other than games increases with age. Given that such sedentary pursuits are relatively new phenomena there is little additional research to compare this finding. However, the finding is in line with previous research which highlights competing behaviours as a negative correlate of PA (Biddle, Coalter et al., 2005) and with FFG (Inchley, Mitchell & Currie, 2010) which reported 44% of adolescent girls in Scotland said they would prefer to do other things with their time as a reason for not taking part in PA.

The researcher reported positive findings in relation to the content and format of the intervention, suggesting it was to the girls' liking. In their investigation into factors associated with change in PA levels in adolescent girls, Neumark-Sztainer and colleagues (Neumark-Sztainer, Story, Hanman, Tharp & Rex, 2003) suggested that interventions focused on this population should seek to engage support from significant others such as

friends, family and caring adults. They proposed that they should also aim to address real and perceived time constraints and assist adolescent girls in developing ways of feeling more confident about themselves and their ability to engage in PA. From the results presented in the current study, in particular the case notes and pupil validity reflections, it would appear that PA consultations are an effective means of achieving this recommendation. Nonetheless, this is contradictory to the questionnaire responses, which did not associate an increase in social support with the intervention.

The case notes also highlighted the need to incorporate more suggestions relating to walking throughout the consultations. The researcher reflected that further information and clarification relating to the benefits of walking in adolescent girls is required in sport and exercise science. This is in line with previous research, which reviewed the effectiveness of walking interventions (Williams, Matthews, Rutt, Napolitano, & Marcus, 2008) and the development of effective walking for health guidelines (Tudor-Locke, Hatano, Pangrazi & Kang, 2008).

These reflections also highlighted the problem of self reporting, especially in relation to intensity levels and sedentary activity. The self reporting of PA is highlighted as a limitation in the current study.

Limitations and future research

Despite every effort by the research team to implement a study of the highest quality, there were some limitations identified, several of which have already been highlighted in the relevant sections. An additional limitation is that it could be argued that the generalisability of the findings in the current study are limited as they were focused in one local secondary school and the findings may be different in another school. Specifically, the feasibility of delivering such an intervention is partly dependent on the goodwill, interest and buy-in from staff which can vary from school to school. However it is suggested that the fit within the PE curriculum is potentially more generalisable. Further, the current study sought to target a relatively narrow population and it is acknowledged that caution should be shown when interpreting these results for use with the general population.

A further limitation of the current study was that the long term impact of the intervention was not tested as there was no follow up. Further, it could be argued that the current

intervention was too short in length to draw any conclusive results. However, guidance surrounding the optimal length of PA interventions for this population is not evident in current literature. Nonetheless, a key aim of the current study was to report on the feasibility of implementing a small-scale PA consultation intervention and as such the length of the intervention was not central to the findings of this aim. Further, the study did seek to establish the feasibility of delivering the intervention within an ecologically valid setting and in turn, the study was delivered in line with school term dates.

A randomised control trial was used in the current study as it assumed groups drawn from the same population, which are randomly generated and are equal at the beginning of a study (Thomas & Nelson, 1996). Using a control group allows a stronger conclusion that any significant differences between groups are the result of the intervention (Thomas & Nelson, 1996). However, it has been suggested that allocating participants to a random group may cause resentment to those allocated to the control group and better adherence by those in the experimental group (Torgerson & Sibbald, 1998). Pupils in the current investigation did report disappointment at not being assigned to the experimental group, which may have influenced their questionnaire responses. For this reason, the proposal by Torgerson and Sibbald (1998) to offer participants the opportunity to refuse randomisation and to offer them an opportunity to receive their chosen intervention at the end of the study (Lowther, Mutrie, & Scott, 2002), may have been an effective way of avoiding this issue. This is a point to consider in the development of a future intervention.

PA consultations are underpinned by TTM and the current study aimed to incorporate the principles of TTM into the wider framework of SCT. However, it was not the aim of the current study to test the validity of either of these theories for use with the current population. Whilst Lowther, Mutrie and Scott (2007) provided evidence supporting the use of the TTM in the British population, their population had a mean age in the region of 40 years old. The construct validity of TTM with the adolescent population requires further investigation and it is proposed that this would be a valuable line of enquiry for future research and would provide further support for use of PA consultation with this group.

A further limitation of the study was not measuring the processes of change given they are a key aspect of TTM and they have received considerable attention in the stage of change literature (Lowther, Mutrie & Scott, 2007), it is suggested future research would

do well to examine this relationship. Examining the relationship between psycho-social variables on PA behaviour or stage of change would also be a useful future line of enquiry. Examination of such an interaction could help to widen our understanding of behaviour modification (Lowther, Mutrie and Scott, 2007).

4.12 Conclusion

In conclusion, this study does not support the use of PA consultations to increase PA and psycho-social variables, but indicates they did help participants advance in their stage of change. However, the findings may have been constrained by lack of power and future research should address this. Adherence to the study from participants was excellent. This, in conjunction with researcher case notes and pupil validity feedback highlights that the participants were engaged and ‘bought in’ to the intervention. The basic tenets of PA consultations appear to be successful in engaging pupils and, with suitable alteration, can be implemented in a school environment, which adds some support to the need for future research to examine this area in greater detail.

CHAPTER 5: ADOLESCENT GIRLS' PERCEPTIONS OF THE INFLUENCE OF THE ENVIRONMENT ON PHYSICAL ACTIVITY

The environment has been identified as a key component of Social Cognitive Theory (SCT). The importance of the triadic relationship between environmental, individual and behavioural factors was discussed in Chapter 2. The current chapter will firstly review literature focussed on the role of the environment on PA and correlates of PA. The key aim of this chapter is to highlight the perceived role that the environment has on influencing PA in adolescent girls. Discussion will link the findings of the current study to previous literature and, in turn, consider the implications of these findings in relation to the development of PA interventions. Chapter 1 contextualised the research and the following literature review has sought to refer to the population of interest where possible. However, at times it has been necessary to look to other populations, as the depth of literature relating to adolescent girls was limited.

5.1 Introduction to environmental correlates of PA

SCT proposes that environmental (e.g. social support, exercise facilities) and individual factors (e.g. SE, competence) simultaneously shape behaviour, both directly and indirectly (Bandura, 1986). Moreover, SCT highlights the importance of the physical and social environment in providing feedback regarding behaviours, opportunities and consequences (Booth, Owen, Bauman, Clavisi & Leslie, 2000). Despite strong theoretical guidance from SCT, much PA research has tended to focus solely on individual-level factors that may influence PA behaviour (Lindquist, Reynolds & Goran, 1999; Sallis, Taylor, Dowda, Freedson & Pate, 2002). More recently, research has proposed that future investigation should be directed across a broader area and in turn, should seek to establish a deeper understanding of PA correlates out with the individual level (Owen, Humpel, Bauman & Sallis, 2004; Sallis, Bauman & Pratt, 1998; Giles-Corti, Timperio, Bull & Pikora, 2005). Specifically, it has been recommended that the influence of the environment on PA should receive further attention (Booth, et al. 2000; Humpell, Owen & Leslie, 2002).

McNeill et al. (2006) defined the environment as: 'both the physical and social environment, as well as the political, cultural and economic environment' (p. 1012) this definition is used as a guide for the current study. Despite the existence of such definitions, the conceptualisation of the social and physical environment, as well as the terminology used to describe each of these factors, is somewhat confusing and at times contradictory. To this extent, Sallis, Bauman and Pratt (1998) acknowledged that environmental and policy research relating to PA has been restricted by a lack of conceptual models as well as measurement issues (see below). Moreover, several studies claiming to investigate the social environment, have tended to focus on only one aspect of this environment; namely social support. Whilst many studies report that they are investigating the physical and social environment or socio-environmental factors, they fail to define what constitutes each of these correlates. In turn, this makes it difficult to establish exactly which components of the physical and social environment have been investigated in PA literature.

As well as issues relating to the conceptualisation of the environment, there are measurement concerns associated with the concept. Van Lenthe, Kremers and Brug (2008) highlighted problems in measuring environmental characteristics and the lack of investigation relating to person-environment interactions. Further, Ball, Jeffrey et al. (2008) investigated the disparity between perceived and objective measures of the physical environment. They suggest, that in order to accurately assess the impact of the environment, objective physical environmental measurements are put in place to avoid self-reporting biases. Such problems were also emphasised by Gebel, Bauman and Petticrew (2007) who, in their critique of review articles examining the physical environment and PA, highlighted the methodological flaws and lack of standardisation which make the interpretation of results in this area difficult. With such issues in mind, it is important that future research investigating the environment and PA behaviour clarifies which aspects of the environment are being explored and how they are to be examined, before conclusions are drawn.

The current study is set in the school environment, which is governed by local and national policy, and as such, it is logical to explore the influence these macro level environments may have on PA and correlates of exercise. However, as the focus of the current study is psychological and not sociological, political or economic, the literature review does not focus on the cultural, political and economic environments.

Nonetheless, it is important to highlight that Scotland is currently implementing the Curriculum for Excellence. The curriculum is set to transform education in Scotland and underpinning the new curriculum is the aim that each child will be enabled as a successful learner, a confident individual, a responsible citizen and an effective contributor (Scottish Executive, 2008). The curriculum covers eight main areas and is less prescriptive than previous education policies in Scotland, with individual institutions being responsible for interpreting the curriculum and key learning outcomes, one core area is health and well being. As a result, the precise curriculum followed by each school differs between institutions and authorities, thus the weighting given to sport and PA will be largely dependent on each school's key aims and objectives. Consequently, whilst the curriculum for excellence offers potential positive opportunities for PA to become a high priority in schools, it is also a possibility that physical activity precedence is lost amongst other aims and objectives.

5.2 Current environmental guidelines associated with physical activity in Scotland

In accordance with a deeper acknowledgment of the relationship between PA and the environment, The Department of Health commissioned the National Institute for Health and Clinical Excellence (NICE, 2008) to produce public health guidance on the promotion and creation of physical environments that support increased levels of physical activity. The report was the first national evidence based report of its kind, and made several recommendations: Firstly, that planning applications for new developments should prioritise the need for people to be physically active, and to ensure that priority is given to pedestrians and cyclists in new developments or in maintenance of streets and roads. Secondly, to ensure that new places of work have good access to walking and cycling networks. Finally, to ensure staircases are clearly signposted and are attractive to use in new or refurbished buildings. The guidelines highlight the importance that is being placed on the impact of the physical environment on PA and this is a positive step. Specific guidelines for schools suggested that school playgrounds should be designed in a way to promote varied physically active play and create different areas for both group and individual activities (i.e. hop scotch). Additional guidance encouraged the promotion of safe and appropriate travel to school. A review of the guidelines was conducted in 2010 (NICE, 2010) and it was identified that until further research is forthcoming, these guidelines are still appropriate.

5.3 Educational environment and PA

The School community has been identified as an appropriate platform for providing regular and structured PA and promoting PA (Fairclough & Stratton, 2005; Durant, Harris et al, 2009). Further, for many youth their only exposure to PA is through school PE (Trudeau & Shephard, 2005; Harris, 2000). Additionally, school PE participation has been linked to overall PA levels (Gordon-Larsen, McMurray & Popkin, 1999), and as such, it is important to ensure that both the social and physical environment within this community is optimal for participation.

Whilst the current study focuses on the school environment, it important to note that there is limited empirical research that targets the role of the school social and physical environments and PA behaviour. Consequently, it is important to draw on literature focussed out-with school that has investigated the potential impact of both the social and physical environment on PA behaviour.

5.4 Physical environment

The term ‘physical environment’ refers to the material objects and facilities present in an environment (Humpel, Owen & Leslie, 2002). It has also been described as: The space outside the person (Sallis & Owen 2002). The physical environment has received increased attention in recent PA literature (Giles-Corti, et al., 2005) due to the limited effectiveness of PA interventions targeted at individual correlates (Giles-Corti, Timperio, Bull & Pikora, 2005). Physical environmental variables associated with PA behaviour include the provision of facilities such as; playgrounds, pavements, parks, swimming pools, changing rooms and gym halls, as well as the availability of equipment. The weather is also considered a physical environmental factor.

Whilst a relationship between the physical environment and PA behaviour cannot be ignored, and theories such as SCT actively support this relationship, research in this area is in its infancy and, as a result, firm conclusions can not currently be drawn. In general, the research in this area has been limited, sometimes methodologically flawed, and often inconclusive (Gebel, Bauman & Petticrew, 2007; Van Lenthe, Kremers & Brug, 2007). This is illustrated by Sallis, Bauman and Pratt (1998) who, in their review of environmental and policy interventions relating to PA, found that, at that time, there was only one study investigating environmental variables and adolescent PA and reported no association between perceived neighbourhood safety, neighbourhood activity models or convenient facilities. Sallis et al., (1998) highlighted the need for further research in this

area and in more recent years there has been an increased focus on the relationship between the environment and PA. Nonetheless, more recent research (Biddle Whitehead, O'Donovan & Nevill, 2005) concluded that no single environmental variable had received enough attention to be classified as a key influencing factor on PA in adolescent girls.

Early research relating to the physical environment and PA behaviour in adolescents has thus far not generated a clear understanding, or identification of influential physical environmental correlates. However, early findings can be used as a basis for future research, and in turn, used to develop interventions. Specific components of the physical environment and the subsequent proposed relationship with PA are now discussed.

5.4.1 Built environment and facilities in the community

The built environment is a component of the physical environment and refers to buildings and structures associated with PA. They include physical structures that have been assembled such as pavements and cycle lanes. The built environment is both indoor and outdoor, and also relates to the provision of facilities for PA.

Research relating to the role of the built environment has traditionally focussed around neighbourhood and community design. For example, the design of the neighborhood has been associated with walking behaviour (Cohen, Scott, Wang, McKenzie & Porter, 2008, Giles-Corti & Donovan, 2002) and 'obesogenic environments' (e.g. environments that encourage physical inactivity and overeating) have also been identified as determinants of obesity (Harrington & Elliot, 2009). Further, the role of the design and form of many American suburbs has been linked to health disparities (Lopez & Hynes, 2006). It has also been suggested, that developing a neighborhood which will support PA behaviour is likely to increase PA participation (Sallis, Bowles et al., 2009).

More specifically, evidence has shown a positive relationship between certain features of the physical environment, such as the presence of pavements, streetlights, and the prevalence of main streets to walk through, and increased PA levels. Each of these physical factors has been shown to encourage PA through walking (Lopez & Hynes, 2006). On the contrary, lack of parks, the presence of high speed traffic, and transport focused on cars has been negatively linked with PA (Lopez & Hynes, 2006). Specific to children, Davison and Lawson (2006), reviewed literature associated with the physical

environment and PA behaviour and found similar results. Such findings have encouraged the launch of a series of Active Travel Programmes, such as Sustrans (www.sustrans.org.uk) which promotes safe and active routes to school. Initial findings from such initiatives are encouraging (Department of Transport, 2006) although effective evaluations of the impact of such environmentally based interventions on PA behaviour have yet to be made (Foster & Hildson, 2004).

Although the literature relating to the role of the physical environment in determining young people's PA is sparse, there are indications of a relationship. For example, Sallis, Prochaska and Taylor, (2000) reported a positive relationship between access and opportunities associated with PA in both males and females. However, they reported the availability of equipment for PA was unrelated. Nelson et al. (Nelson, Gordon-Larsen, Song & Popkin, 2006) investigated the association between several built and social American environments and PA in adolescents. They identified robust classifications of neighbourhoods that were based on previously identified environmental correlates of PA. The authors believed that classification of the environments and PA data associated with each neighbourhood enabled a deeper understanding of the specific environmental components of each neighbourhood that could be targeted in interventions. However, they acknowledged there are differences in activity levels between older and newer suburban neighbourhoods. Nonetheless, what is more relevant for the current study is the authors' acknowledgement that a better understanding of specific environmental conditions is necessary to develop effective interventions. Similar conclusions were drawn by Ferreira et al. (2006) who conducted a systematic semi-quantitative review of 150 studies examining environmental correlates of youth PA. They identified low crime incidence as the only characteristic of the neighbourhood, associated with higher PA levels in adolescents. No other environmental factor was highlighted as having an important role in PA behaviour. However, the study suggested that despite the results, rather than the influence of the environment on PA, future studies should seek to establish causal relationships between the environment and PA. Moreover, they proposed that future research in this area should be conducted with clear, possibly standardised, definitions and objective measures of environmental components as well as objective measures of PA behaviour.

Research relating to personal factors and the physical environment has also been conducted. Motl, et al., (2005) investigated the influence of perceived neighbourhood

safety and facilities on PA behaviour, with the possibility of SE as a mediator. Over 1000 participants (mean age of 13.6 years) completed self-report measures relating to the environment, barriers, SE and PA, over two time points. There was no significant relationship shown between neighbourhood safety and PA. However, equipment accessibility showed a significant cross sectional, but not longitudinal, direct effect on PA. Further, SE was shown to mediate overcoming barriers for the cross-sectional effects. This finding supports the SCT approach to understanding and targeting PA behaviour as detailed in previous chapters.

In a replication and extension of the previous study, Motl et al., (2007), advanced upon their examination of SE as a factor accounting for effects of perceived neighbourhood safety and perceived equipment accessibility; they also investigated perceived SE as a factor accounting for perceived social support on self-reported PA. In this instance, perceived neighbourhood safety did not exhibit direct or indirect effects on self-reported PA levels. Perceived equipment accessibility exhibited an indirect effect on self-reported PA and, as in the first study, this effect was mediated by barriers SE. Perceived social support showed direct and indirect effects on self-reported PA, barriers SE also accounted for this indirect effect. This paper only measured perceived social support and it is possible that measuring actual social support may provide further understanding of the role of social support on PA and additional correlates of PA. It is also important to acknowledge that this research has identified a link between the neighbourhood environment and personal correlates of PA and as such is a potential area of future research.

Research assessing the relationship between venues for PA and actual PA behaviour has also been conducted. Dowda, McKenzie et al., (2007) investigated the relationship between the role of commercial venue facilities (e.g. dance studios, aerobics halls), and non school PA in adolescent girls. Questionnaire data was collected from 1556 girls, relating to their residential addresses and commercial facilities, 7 days of accelerometer data was also collected. Results indicated that girls who lived near one, or more, commercial PA venue had a higher non-school MET-weighted moderate-to-vigorous PA, than those who had no such facilities near their homes. A similar study conducted by Pate, Colabachi, et al., (2008), investigated the availability of neighbourhood facilities and PA levels in adolescent girls. As with the previous study, there was a significant positive relationship between the number of commercial venue facilities and PA levels.

Further, there was a positive association between the number of parks in a neighbourhood, and total MET's in white participants. Again, the potential influence of PA facilities present in a neighbourhood and PA behaviours in adolescent girls is prevalent. The study suggested that future research should be focussed around establishing causal and temporal relationships between the two.

Further evidence supporting a relationship between the built environment and PA in youth was provided by Ammouri, Kaur, Neuberger, Gajewski & Choi (2007). They examined correlates associated with PA in 300 American adolescents. The study investigated environmental correlates associated with PA by using the Neighbourhood Environment Scale (NES) developed by Sallis and colleagues (Sallis, Johnson, Calfas, Caparosa & Nichols. 1997). The scale contained items relating to the neighbourhood, perceived safety and home supplies and equipment. It was reported that environmental opportunities for exercise across these three domains led to an increase in PA behaviour in adolescent girls. Earlier research carried out by Cox, Coleman and Roker (2005) investigated determinants of sport and PA participation in older adolescents in England. Whilst the findings of the study are of interest, they are rather contradictory. On the one hand, Cox et al., (2005) reported environmental changes which could increase participation levels include; making facilities easier to access, providing female only facilities, reducing the cost of facilities and providing a wider choice of facilities. In contrast, when they reviewed the determinants related to participation, Cox et al. reported that young women did not view environmental issues as very important relating to participation. However, it is not clear which of these factors related to sport and which related to PA, a distinction which would have been helpful. As with previous studies, there is no clear definition of the factors included under the term 'environment', but inferences from the report encourage further investigation in this area.

In Scotland, Biddle, Coalter, O'Donovan, MacBeth and Whitehead (2005) examined correlates associated with PA behaviour and adolescent girls. In relation to the physical environment, they investigated the perceived impact of the neighbourhood and access to facilities on PA levels. They reported that 54% of the participants described their neighbourhood as 'intimidating' and 47% of this group felt that this had an impact on their PA levels. Participants also reported that access to facilities had an impact on their PA participation. Also in Scotland, Whitehead, Biddle, O'Donovan & Nevill (2006) carried out a study addressing social-psychological and physical environmental factors in

adolescent females of differing ages. The study found that for both age groups (age 11-13 and 14-16 years), home equipment use was more important in more active participants. In the older group, more active girls scored higher in neighbourhood perceptions and the use and enjoyment of local facilities. However, the reasons for these preferences and the important differences highlighted between age groups are not understood. Consequently, the researchers' propose future research seeks to appreciate older girl's specific requirements for their physical environment.

Results to date indicate a relationship between the built environment, facilities and PA in adolescents and this early research encourages appropriate future investigation. Whilst it is important to be aware of the impact that the built environment can have in relation to the neighborhood and community provisions and resources on PA, the current study is focused on the school environment, and consequently research focused on the neighborhood will be used to shape the current study, but will not be a key area of investigation.

5.4.2 School built environment

The focus of the current study is on the provision of facilities for PA during PE, for example; the provision of buildings for PA, such as gym halls and swimming pools. Facilities such as these will be the focus in the current study, rather than overall school design as the current study is focused on PE and not a whole school approach.

As with other aspects of the environment, there has been limited research conducted relating to PA provisions and PA behaviour in schools. The 2008 PASS report investigating PA in Scottish school children (Inchley, Kirby & Currie, 2008), went some way to examining the relationship. It provided a review of the impact of access to facilities and equipment in the neighbourhood and home, in relation to PA, but did not provide extensive information relating to school facilities and equipment. However, one study contained in the review, highlighted that changing facilities were an important feature of the PA physical environment. Similarly, Biddle, Coalter et al., (2005) consulted with schools regarding PA behavior and indicated that the most common comments from staff in relation to provisions for PA were associated with insufficient facilities. This related to games halls that were not of an adequate size, a lack of indoor PA facilities, all facilities being used to capacity and poor maintenance and cleanliness of flooring. Additionally, shower and changing facilities were highlighted as a potential influencing

factor, with open showers negatively influencing motivation for PA. O'Dea (2003), who investigated healthy eating and PA behaviours in children and adolescents, also reported that adolescents felt that providing private doors on shower and changing facilities were important.

In their review of environmental correlates of PA and youth, Ferreira et al. (2006), investigated the potential impact of the school environment. They suggested that the school environment is an ideal opportunity for PA promotion, and the authors highlighted that school based interventions that are both well designed, and well implemented, can have a positive impact on increasing PA behaviour in adolescents. Nonetheless, the study reported that there has been limited research investigating the specific features of the school environment that influence adolescent PA. It was emphasised that although the majority of the 150 studies included in the review recruited participants from the school environment, specific aspects of the school environment were largely unexplored. Despite this, the review did highlight some environmental factors within the school environment that were associated with variations in PA levels. These factors are included as appropriate in the following sub sections.

Also investigating PA in the school environment, McKenzie, Marshall, Sallis and Conway (2000) examined the PA behaviours of adolescents during school leisure time in 24 American middle schools using the System for Observing Play and Leisure Activity in Youth (SOPLAY). Findings reported that the basic provision for PA in terms of facilities and opportunities was present in all the schools in the study. However, sometimes lack of supervision and conflicting school policies meant that participants could not access facilities and equipment out of class time. Additionally, PA was not promoted before and after school, and as such the facilities were not utilised during these periods. The authors also demonstrated gender differences in school leisure time PA in relation to PA facilities and opportunities, and thus recognised that future interventions need to be tailored according to sex. Similarly, in their investigation of school design, and in school PA with 1566 adolescents, Cohen and colleagues (2008) concluded that overall school design has only a small association with PA, and that other factors, such as programming of PE, and social factors, are more likely to impact on overall PA.

In Canada, Fein, Plotnikoff, Wild and Spence (2004) also examined the role of the school environment and PA with 610 participants (mean age of 15.5 years). A component of the study sought to investigate the relationship between the perceived availability of physical

environmental resources and the perceived importance of these resources in relation to PA levels. The study adapted SOPLAY (Sallis et al., 1997) for assessing the perceived physical environment of the home, neighbourhood and convenient facilities, by including the school environment (NES). It was reported that home, neighbourhood, and school environments explained 5% of the variance in PA, whereas the perceived importance of these environmental constructs explained 8% of the variance of PA. Of the four environmental variables measured, the perceived importance of the school environment was the only construct significantly associated with energy expenditure. Fein et al's inclusion of the school environment to the original SOPLAY instrument did not demonstrate further significant findings. Nonetheless, hierarchical regression highlighted perceived importance of the school environment as the only significant environmental construct, suggesting that the school environment is worthy of further investigation. It was also suggested that the school environment was more influential on male PA behaviour, than that of females. They suggest that further research is needed to establish deeper understanding of the relevance of school environments to female adolescents in order to adapt the environment appropriately.

The limited literature relating to the school environment and subsequent relationship with adolescent PA was highlighted by Durant, Harris, et al., (2009). They administered questionnaires to 165 American adolescent males and females (mean age 14.6 years), assessing a number of school environmental factors, such as days of PE per week, school equipment accessibility, after school supervised PA and after school field access. Results indicated that there was a positive correlation between days of PE per week and access to school fields after school, and overall PA. Independent of all other school factors, there was a correlation between days of PE per week and overall PA levels. The association between after school field access and overall PA was mediated by the use of publicly accessible school facilities for PA. There was no correlation between either after school supervised PA, or school PA equipment. Despite concerns relating to the self report measurements used for PA and the possible biases associated with this, the findings of the study suggest that it would be effective to investigate the specific components of the PE environment (e.g. type of activity offered, size of class and length of class). The authors suggested that any investigation relating to the school physical environment and PA is to be applauded and they highlight the potential use of PE as a suitable environment for promoting PA. As the current study is concentrated on the physical environment

associated with PE, rather than leisure time activity, the areas of future research suggested by Durant et al., are of specific interest.

One study that explicitly investigated the association of PE environments and youth PA was conducted by Sallis, Conway, Prochaska, McKenzie, Marshall & Brown (2001). The study defined environmental variables as area type (i.e. court, playing field etc.), area size and permanent improvements (such as tennis courts or soccer goals). Pupil participation, the presence of equipment, and level of supervision across a variety of time frames were observed, using SOPLAY, in 127 US middle schools. It was reported that environmental variables and subsequent interactions explained 42% of the variance in girls' non participation in PE. When improvements to the school physical environment were made, and adult supervision was provided, the number of girls participating in PA increased five-fold, as compared to when the environment was not satisfactory. However, exactly how the environment should be tailored to promote PA participation is not overtly clear from the study.

In Scotland, the aforementioned FFG training programme was recently launched to facilitate PE staff and active schools co-ordinators in engaging girls and young women in PA. The programme was launched in 2008 and is being delivered to all secondary schools in Scotland over a 3 year period. Preliminary reviews of the programme (Fit for Girls, 2008, Inchley, Mitchell, & Currie, 2010) have reported several early indications of the potential influence of environmental factors on PA behaviour. For example, the programme found that providing a girls' only class for PE was positively received, as was the provision of opportunities for non competitive activities during PE. It was also suggested that improving changing facilities led to an increase in PA participation. This interim report highlights the role of the school environment on PA and correlates of PA as important.

Whilst each of the aforementioned studies indicates that there is a potential link between the school environment and PA behaviour in adolescent girls, they are limited in providing information relating to the specific aspects of this particular physical environment and in turn how they may impact on PA behaviour.

5.4.3 Weather

The weather has been identified as an environmental barrier to PA (Merrill, Shields, White & Druce, 2005; Allison, Dwyer & Makin, 1999; Sallis, Bauman & Pratt, 1998), and a systematic review of seasonal effects on PA behaviour (Tucker & Gilland, 2007) suggested that during winter and autumn months, adolescent PA decreased more than in the spring and summer months. Only one study in the review reported that there was no relationship between seasonal variance, and PA behaviour (Gordon-Larsen et al, 1999). The review concluded that PA fluctuates with seasonal variance and for this reason they suggest that interventions aimed at enhancing PA should take this variance into account. Similarly, Broderson, Steptoe, Williamson and Wardle (2005) investigated the environmental correlates associated with PA and sedentary behaviour in over 4000 11-12 year olds. They reported that when the weather was wetter, girls were less active. Their findings suggest that bad weather conditions were negatively correlated to PA levels.

Due to the often extreme changes in the Scottish weather it is possible that this is particularly important environmental factor that influences PA participation in Scotland. Moreover, the provision or lack thereof, of facilities by schools in adverse weather conditions could have an impact on PA levels. This is of particular importance as it has been shown in a number of American studies that outdoor lessons have higher rates of physically active as compared to indoor lessons studies (McKenzie et al, 2000, 2006).

5.4.4 Type and choice of activity

Type of activity and availability in relation to choice of activity on offer, have been included as physical environment factors as they can be categorised as; physical facilities and opportunities outside the individual. In recent years, there has been a move away from more traditional PE classes in the UK, such as swimming and basketball, to more novel approaches to PA, such as dance (Green, Smith & Roberts, 2005). However, inactivity rates in adolescents have increased, raising important questions about activity opportunities, choices, and PA behaviour.

The type, or content of a PA class, has been reported as related to PA levels. A Hong Kong based study (Chow, McKenzie & Louie, 2008) explored a variety of environmental influences on school PE in 9-12 year olds. They identified subject matter as a correlate of PA levels. For example, it was highlighted that volleyball and basketball lessons were

substantially more active than track and gymnastic lessons. The study also suggested that the way in which teachers delivered lessons influenced PA levels, something that is potentially worthy of consideration in the current study.

In relation to choice, the aforementioned FFG initiative (Inchley, Mitchell & Currie 2010, Mitchell, 2010) has produced evidence suggesting that offering adolescent girls their preferred type of activity is preferential: Questionnaire analysis has indicated that 73% of Scottish adolescent girls have said PE would be better if there were a wider variety of activities and focus group research identified activity choice as a main theme in the examination of 'disengagement' from PE. Additional empirical research relating to activity choice and PA behaviour in adolescents specific to school PE was conducted by Prusak, Treasure, Darst and Pangrazi (2004). They investigated the effects of choice on the motivation of adolescent girls in this setting and reported that increased choice led to greater intrinsic motivation, higher regulation, less external control and less amotivation. They concluded that adolescent girls may benefit from experiencing greater choice in school PE. In England, Smith, Green and Thurston (2009), as part of a large scale investigation into the role of PA and sport in young people's lives, focussed in part on activity choice in PE. Pupils reported that teachers offered a variety of activities and this was viewed as a very positive aspect of the PE experience. Pupils reported that choice of activity and being able to take part in their chosen activity resulted in greater enjoyment and engagement with PE. Enjoyment and having fun have been identified as key correlates of PA (Dishman et al, 2005; Whitehead & Biddle, 2008; PASS, 2008) and they have also been shown to moderate efficacy in a PA interventions (Williams, Papandonatos, et al., 2006). The findings of Smith, Green and Thurston, further support such a relationship. Similarly, a study conducted by Hohepa, Schofield and Kolt (2006) investigated high school students' views of PA in New Zealand. Activity choice was identified as a 'very positive feature' of the PA environment. This gives further support for investigating the potential role that choice of activity may play in the school PA environment in the current study.

In non-adolescent populations, an early study (Thompson & Wankel, 1980), investigated the effects of perceived activity choice on exercise attendance in 36 female fitness club members. The study reported that participants who were assigned to an exercise condition based on their preferences had better attendance than those who were given a standardised (no choice) exercise programme. Interestingly, those in the choice condition

reported that they had greater intention to continue exercising at the end of the programme than those in the no choice condition. Another study focussed in this area (Daly & Maynard, 2003), investigated negative affect scores pre and post exercise in participants who were offered a choice of aerobic exercise methods (e.g. treadmill running, gradient walking, rowing ergometry etc.) versus those who were only offered one means of aerobic exercise (cycle ergometry only). The results indicated that those in the choice conditions had lower negative affect scores pre and post exercise than those in the no choice condition. As well as affect, perceived exertion and activity choice has also been studied. Parfitt and Gledhill (2004) studied the perceived exertion rates across two exercise conditions. They reported that low-active adults assigned to the group who received their first choice for aerobic activity reported lower rate of perceived exertion (RPE) as well a greater positive affect than those who received their third choice of aerobic activity. However, it may be the case that RPE reflects less activity taking place in activities participants have a preference for, which is not necessary a positive aspect in term of health and fitness.

5.4.5 Quantity and timing of physical activity

Quantity and timing is termed a physical environmental factor as it does not refer to the people involved, but rather, the physical concept of time. Current policy in Scotland suggests that secondary school aged children obtain 2 hours of PE a week in school. However, this is only a guideline, and as a result, schools are not obliged to provide this level. Indeed, the PASS survey, conducted to assess PA behaviours in Scottish youth, (Inchley & Currie, 2004) indicated that ‘the majority of pupils’ reported receiving only 1 period of PE a week and only 25% reported that they have two or more periods week. However, FFG (2010) has reported that 74% of Scottish girls had spend one and a half hours or more in PE during the previous week, which is more encouraging than the earlier PASS findings.

Many adolescents note that time is a major barrier to being physically active (Allison et al. 1999), and when PA is competing for time with other activities it is important to understand the role that suitable timings of PA opportunities may play in PA uptake. As was previously mentioned, the school environment is an ideal opportunity for young people to have timetabled PA and if the timing and provision of this activity is not suitable then an ideal opportunity for PA behaviour may be lost.

Tracking of PA patterns has shown that in the transition from primary school to secondary school children are less likely to be active during lunch and break times as they get older (Niven, Fawkner, Knowles & Henretty, 2009). The reasons for this are multiple, however it is important to note that the provision of PA in the form of PE classes, may be more important for the older adolescent population. Similarly, recent research by Atkin (2009, Atkin et al., 2008), identified that adolescent girls are less likely to be active in the three hours immediately after school, than at other times of the day. Whilst this clearly highlights the need for PA interventions to be targeted during these 'critical hours', it also illustrates two other points. Firstly, that school PE is a key area to target and promote PA effectively and secondly, timing may play an important role in influencing PA behaviour.

5.5 Social environment

The social environment refers to; environmental conditions created out-with material objects (McNeill, Kreuter & Subramanian, 2006). With reference to PA, the social environment is often a consequence of the people involved (Kuo, et al., 2009) and can include social support, exercise climate and the composition of the exercise environment. Given that the social environment involves people, it is unsurprising that there is often an overlap between the personal and environmental components of SCT. Indeed the term 'psycho-social' highlights that these factors are inter-related and SCT highlights that they are reciprocal and ever changing. As with the physical environment, several social environmental variables are correlated with PA behaviour in adolescents (Sallis & Hovell, 1990; Sallis, Prochaska & Taylor, 2000; Biddle et al, 2005). However, similar to the physical environment, research in this area is in its infancy and often fails to address social correlates from a clear theoretical perspective; accordingly it has been difficult to draw firm conclusions in this area.

This acknowledgement is echoed by Biddle and Mutrie (2008), who state that not enough is known about the relative influence of environmental variables in relation to psycho-social variables in determining PA levels across all populations. There are also suggestions that once the physical provisions for sport and exercise are in place, more time is needed to be devoted to developing a culture which encourages PA participation and maintenance (Coalter & Dowers, 2006). Accordingly, fostering the correct social

environment for participation and maintenance of PA requires the precise requirements of this environment to be established.

5.5.1 Social support

There are a broad range of definitions of social support, with most referring to any behaviour that assists an individual in achieving desired goals or outcomes (Taylor, Baranowski & Sallis, 1994). Social support has dominated much of the research in relation to the social environment and PA, and it has been identified as a correlate of PA in children and adolescents (Biddle et al 2005; Taylor & Sallis, 1997; Sallis et al., 1992). With this in mind, it is unsurprising that a lack of social support has shown to have detrimental effects on PA participation (Stahl, et al., 2001).

Social support is a multidimensional concept, which is usually motivational in form, and has been categorised into three main types or functions: emotional, informational and material (Taylor, Baranowski & Sallis, 1994). Emotional support refers to; empathic support from others in one's attempt to be physically active, and a belief that they are supporting this endeavour. Informational support concerns information and advice offered by others, such as where and when an exercise class may be taking place. Finally, material support is direct help in one's pursuit to be physically active. This could include parents driving children to and from physical activities, or buying them equipment which will enable them to be physically active. Social support stems from a variety of sources, such as peers, family, teachers, exercise leaders and partners. Cohen et al. (2000), proposed four potential psycho-social mechanisms to explain how social support may influence behaviour. These mechanisms include social influence (e.g. peer pressure); by influencing psychological states (e.g. SE and self worth); by providing information relating to health behaviours (e.g. provide PA guidelines) and the provision of service (e.g. host an exercise class).

In relation to SCT, Bandura (1977) highlighted the importance of modelling and observational learning in behaviour change thus suggesting that family, peers and teachers act as important models and social referents for children and adolescents. A role model has been defined as 'anyone an individual comes in contact with, either directly or indirectly, who potentially can influence their decisions or behaviours' (Bandura, 1977). A role model is someone an individual perceives as worthy of imitation (Yancey, 1998)

or who inspires an individual (Ingall, 1997). They can be particularly influential during adolescence as this is the time in which identity exploration and development occurs (Marcia, 1994). In adolescents, a role model may be in the form of parents, friends, coaches and teachers (Kirby, Niven & Fawcner under review).

In relation to both social support and role models, theoretical models of motivation propose that the nature and interpretation of social relationships are key to motivational processes (Ulrich-French & Smith, 2006). Thus, the theory supports the notion that social support influences PA behaviour. Moreover, social support has regularly been reported as a correlate of PA. For example, in a recent review which examined environmental correlates of PA in youth (Ferreira et al., 2007), social support from significant others, was identified as a consistent positive correlate of PA. Similarly, Neumark-Sztainer et al. (2003) identified social support from a variety of sources, as a strong influencing factor associated with increasing PA behaviour in active adolescent girls. Despite the wealth of evidence to support the positive effects of social support on health behaviours such as PA, the way in which social support works, or the mechanisms behind this effect, are still largely unknown (Stahl et al. 2001). Further, given the potential impact peer and significant others may have on adolescents, this is an area of interest.

Family support

Bandura (1986) proposed that parental role modelling was children's identification with their parents, as a form of influence they can reproduce through observation, and social learning processes. Parental social support has received moderate investigation in PA literature. In most instances there has been a positive correlation between all types of support and PA behaviour in adolescents (Heitzler, Martin & Duke, 2006; Sallis, Nader & Broyles, 1993; Sallis, Simons-Morton, Stone, et al., 1992; Sallis et al., 1992;). For example, Biddle, Whitehead et al. (2005) identified family and parental support as a positive correlate of PA behaviour in adolescent girls. Sallis et al. (2000) reported that adolescent PA was associated with direct parental help, parental support, support from significant others and sibling PA. Beets et al. (2006) highlighted that parental support was evident in providing transport and encouragement, as well as physically playing with their children. However, they noted some interesting gender specifications whereby mothers were seen to participate with and encourage girls whereas fathers participated and encouraged boys. They also reported that boys perceived greater parental support than girls.

In their longitudinal study, Ornelas et al. examined the mediating effects of parental support and PA (Ornelas, Perreira and Ayala, 2007). The study investigated parental influences on adolescent PA and reported that positive parental relationships were related to adolescent self-esteem, which in turn led to increased PA. The study also suggested that adolescents who are raised in an autonomous and warm household are possibly better at regulating their own PA levels. Ornelas et al., (2007) proposed an indirect link between parental support and PA, which is important for developing a deeper understanding of the way in which social support functions. It was concluded that, in order to promote PA in adolescents, time is better spent developing self-esteem through increasing family cohesion and communication. This is in line with more recent research investigating the influence of parental support on adolescent PA (King, Tergerson, & Wilson, 2008), where it was reported that children who were more active, had parents who were supportive of PA and promoted it in a positive manner. However, no differences in activity level were identified for adolescents who had an active parent than those without. Similar results were reported by Anderssen, Wold and Torsheim (2006), as well as by Trost and colleagues (2003), who reported that PA was not related to parental PA levels or parental enjoyment of PA. They reported that informed inactive parents could provide as much social support as active parents. As with previous findings, understanding the mechanisms behind social support would potentially provide an explanation for such findings.

Several studies have reported that the effects of parental support and parental participation in PA changes as girls get older. Whitehead, Biddle, et al. (2006) found that, for younger adolescents, their mother's participation and the positive importance they placed on PA were the most important distinguishing factors between low and high active girls. For older girls, parental support was not such an influencing factor. This finding was supported by the PASS study (Inchley et al., 2008), which reported that, as girls become older, parental influence is no longer associated with PA levels. Such findings suggest that the older girls are more autonomous about their PA and prefer to move it away from the home. Thus, it could be suggested, that parental support is possibly more important in establishing a positive attitude towards PA in the younger years, whereas in older adolescents the emphasis may be on other forms of social support out-with the home. Voorhees et al. (2005) reported that during adolescence, peer influence increases and peer supportive behaviours during this time have been associated with PA behaviour. Similarly, Beets et al. (2007) examined peer and parental support in rural high school

students and established that social supportive behaviours of peers influenced PA behaviour, but social support from parents was not relative to PA levels. Other studies have indicated that during adolescence, peers pose a greater influence than family members (Hohepa et al., 2007; Springer, Kelder & Hoelscher, 2006). This compliments research that indicates older adolescents were likely to spend more time with their friends and peers than they are with their parents both in and out of school (Duncan, Duncan & Strycker, 2005).

Peer support

In line with the aforementioned findings, the influence of peer social support on PA has also received considerable attention in social support literature. Smith (1999) suggests that peer support is effective in contributing towards the enjoyment of PA, through providing companionship, recognising accomplishments and providing esteem support. However, as with the aforementioned physical environmental correlates of PA, literature relating to peer support and PA behaviour is often conflicting, and thus, strong inferences are difficult to make. For example, Biddle, Whitehead et al. (2005) reported inconclusive findings related to peer-related variables and PA, as did Prochaska, Rodgers and Sallis (2002). Similarly, Sallis et al. (2000) reported that the relationship between perceived peer support and PA was indeterminate. Nonetheless, there are findings that suggest evidence of a relationship, for example, Biddle, Coalter, et al. (2005) reported that 81% of adolescent girls preferred to have a friend with them whilst being physically active. The report also highlighted that 45% of girls would not take part in PA if their friends wanted them to take part in an alternative activity. Similarly, Duncan, Duncan and Strycker (2005) reported that youth who perceived greater support for PA from friends, had higher levels of PA. This was echoed by King et al. (2008), who found that adolescents who had a friend who engaged in PA, reported higher levels of engagement in PA than those who did not. Additionally, correlation studies examining peer modelling, reported that peer support, encouragement and joint PA participation are positively associated with increased PA levels in children and adolescents (Davison & Schmalz, 2006; Springer et al., 2006; Sallis et al., 2002).

Peer support and PA was also explored in the PASS report (Inchley, et al, 2008). Both males and females reported a decline in peer support across the primary-secondary school transition; however the decline was more gradual in boys than in the girls. Among younger adolescent girls (Primary Seven or S1), it was reported that there was no

relationship between PA and peer support. However, during S2-S4 there was a significant association with those reporting low peer support showing to be less active. Interestingly, the report also highlighted that in primary school there was a significant association between socialising and PA, but this association was not evident in secondary schools. The study proposed that as girls get older, they are less likely to partake in active pursuits when they are with their friends.

Beets et al. (2007) investigated SE and social support relating to PA and also reported a positive effect of peer social supportive behaviour on PA levels. The notion of peer social support increasing PA behaviour in adolescents has also been reported by Voorhees, Murray, et al. (2005) who explored the relationship between adolescent girls' PA levels, in relation to the PA level of close friends. The study found that the frequency of activity with friends is the most significant predictor of girls' own PA when all variables were included in the multivariate model. However, girls who were less frequently active with friends have lower overall levels of PA, suggesting that time spent away from friends was usually not spent being physically active.

Further evidence suggesting a link between peer support and PA comes from Di Lorenzo et al. (1998). They reported that social support from friends and peers was an important factor in being physically active (DiLorenzo, Stucky-Ropp, Vander Wal & Gotham, 1998). Similarly, Taylor et al. (1999) correlated fun with skill, winning and participating in sports with family and friends. This is also supported by Bungum and Vincent (1997) who highlighted that peer support is particularly strong influence on PA among women. In addition, Smith (1999), examined perceptions of peer relationships and PA participation in children aged 12-15. Whilst the main emphasis of this study was on testing a particular model, the study reported that perceptions of peer relationships and friendships can influence PA attitudes and behaviours. The study went on to propose that PA interventions should aim to enhance peer relationships in the PA setting in order to promote active living, and also, that future research should seek to develop a deeper understanding of the nature and impact of peer relationships in the PA environment.

Teacher and exercise leader support

As has already been discussed, parental influence on PA may not be as strong as in younger adolescents (Whitehead, Biddle, O'Donovan & Nevill, 2006). In fact, adolescent girls are likely to have exposure to PA out-with the home, and will almost definitely

receive PA instruction in school. Therefore, the consequent influence of those delivering PA to adolescent girls, in terms of the support they give and the leadership style they adopt seemingly merits investigation. Support for this is provided by Franklin (1986), who in reference to adult exercise programmes, proposed that “*although numerous variables effect participant exercise compliance, perhaps the most important is the exercise leader*” (p.12). Additionally, Chapter Four highlighted four sources of efficacy information. Both imitation and modelling and verbal and social persuasion can be influenced by the social environment an individual is exposed to (Fox, 1997). For example, imitation and modelling is reliant on observing others either succeed or fail and of particular interest here is the use of certain types of individuals in promoting exercise to particular groups, such as low active girls. Models used to promote PA in the media are notoriously glamorous and have a lean and athletic physique. The influence of the physical appearance as well as the previously mentioned styles of exercise leaders and in particular PE teachers is an area lacking empirical research.

The FFG (2008, Inchley, et al. 2010) study, has provided anecdotal evidence that the role of the type of exercise leader delivering PA may have both a direct and direct impact on PA participation, in particular 35% of girls felt that having a female PE teacher was important. Further, a study conducted by Luke and Sinclair (2001) identified teachers’ behaviours as the most important determinant of students’ attitudes towards PE. Similarly, Barr-Anderson and colleagues (Barr-Anderson, Neumark-Sztainer, et al., 2008) highlighted the important role that teacher support may play in encouraging physically active lifestyles, enhancing SE for leisure time activity, promoting social norms of PA and ensuring boys are respectful of girls during PE.

Despite emerging evidence of the important role of exercise leadership and PA behaviour, this area is not well developed. Carron et al. (1996) identified only nine studies that investigated exercise adherence that contained measurements related to exercise leadership. This meta-analysis reported an effect size of 0.31 for the leadership-adherence relationship in adults. Thompson et al. (2003) and Godin and Shephard (1984) in line with SCT, believe that modelling by teachers in PE plays an important role in PA behaviour especially in older adolescents. In their follow up to Sallis et al’s (2002) paper, Ferreira et al (2006) reported that role modelling and support from teachers was generally unrelated to PA levels in adolescents. The inconsistencies in this area indicate that further and more rigorous research is required in order to shape future interventions.

One area of teacher support that has received moderate attention is that of teacher feedback in school PE. Much of this research is related to Self Determination Theory (SDT) (Deci & Ryan, 2000) which represents motivation across a continuum from most self-determined (intrinsic motivation) to non-self-determined (external regulation). A French study conducted by Nicaise, Bois, Fairclough, Amrose and Cogernino (2007) investigated high school male and female pupils' perceptions of feedback from PE teachers. The study investigated whether teacher feedback was perceived differently by boys and girls and whether the sex of the teacher had an impact on this. They also explored the effects of several types of feedback on students perceived competence, effort, enjoyment and PE performance. Results indicated that gender of the student, and teacher plays an important role in pupils' perceptions of their interaction. It is anticipated that these perceptions shape behaviour, cognitions and affective responses (Harter, 1998; Smoll & Smith, 1989). It was also reported that pupils' perceived competence, effort, enjoyment and PE final performance were higher when their teacher spent more time with them and when they perceived praise from a teacher following a good performance.

Also examining the role of teacher feedback, Ntoumatis and Standage (2009) reviewed a number of schools based PE studies which employed SDT. They reviewed the relationship between teachers' interpersonal style and student motivation and they examined studies which sought to optimise teacher and student interactions. They also examined the role of basic psychological needs and motivational regulations on behavioural, affective, and cognitive outcomes during PE. Following their literature review, they provided practical recommendations for teachers to employ during PE. These recommendations suggest that teachers use interpersonal styles which support students need satisfaction and autonomous forms of motivation. Specifically, they suggest that teachers are trained in providing opportunities for choice and input, ways to empathise with students' points of view, means of establishing peer-learning groups and support cooperation. It is proposed that such skills will aid teachers in structuring motivationally adaptive classes. Further, it is proposed that when a student is displaying disinterest in PE the teacher works on autonomy supportive techniques such as recognising the pupils feelings about the activity, use language expressing choice and highlight a solid justification for taking part in the activity. Recommendations also proposed by Mouratidis and colleagues (Mouratidis, Vansteenkiste, Lens & Sideridis 2008) in their review of teacher feedback and competence environments.

Also central to SDT, is the concept of autonomy. Reeve (2002) found that autonomous motivation can be enhanced through the interpersonal style of significant others who provide instruction and feedback with regard to goal-directed behaviours. A number of other studies have also reported that, across a variety of different environments, when leaders display behaviours that encourage autonomy, higher levels of autonomy towards the task at hand, as well as greater persistence, commitment, enjoyment and well being are observed (Hagger, Chatzisarantis, Culverhouse & Biddle, 2003; Black & Deci, 2000).

McKenzie, Stone et al. (2001) conducted an intervention study in American primary schools in which they examined teacher type, and lesson location. In relation to teacher type, the study investigated the effects of a class room teacher delivering PE versus specialist PE teachers. Despite increases in lesson context and PA levels for both groups, the intervention group (taught by specialist teachers the pupils) received substantially more PA than those in the intervention generalist group. The study suggests that PE should be taught by specialists who receive ongoing training regarding their practice.

Cox and Williams (2008) explored the roles of perceived teacher support, motivational climate and psychological need satisfaction on student motivation in PE. It has previously been reported that more self-determined individuals exhibit greater persistence, effort and enjoyment than those with less self-determination (Deci & Ryan, 2007). The study reported that perceived teacher feedback appears to be integral to supporting the development of self-determination in PE. They suggest that future research should aim to empirically test the relationship between perceived mastery climate and perceptions of teacher support.

As well as a limited number of empirical studies relating to school PA leaders, and PA behaviour, there has been some investigation in to leadership in other settings. Fox, Rejeski and Gauvin (2000) investigated the effects of leadership style and group dynamics on enjoyment of PA in male and female undergraduate students. Students were exposed to one of two forms of leadership style; socially enriched or bland group dynamics. Enriched leadership style consisted of positive reinforcement, contingent rewards, encouragement and individualised feedback. Results demonstrated that those exposed to enriched leadership, combined with an enriched and supportive group environment, reported more positive feeling states, greater enjoyment, greater increases in

SE, and stronger intentions to exercise as compared to those exposed to other conditions. A limitation of this study was that it was only conducted over one exercise class (step aerobics), and thus the long term effects of the conditions are unknown. Further, whilst the participants were novices in terms of step aerobics, they were quite an active group, and as a result, the generalisability of the results across less active groups is limited.

Building on the original study conducted by Fox et al. (2000), Bray, Millen, Eidness and Leusinger (2005), investigated the effects of leadership style and exercise program choreography on enjoyment, and intentions to exercise, in novice female exercisers. The programme was a randomised 2 x 2 design with a manipulation of leadership style (instructionally and motivationally enriched verses bland) crossed with manipulated choreography style, consisting of either restricted or varied exercises. Results showed that where there was socially enriched leadership, and varied choreography, this led to greater enjoyment of the class. There was however, no relationship for exercise intention which has potential implications for understanding the relationship between enjoyment and intention to engage in an activity in the future.

The field of sport psychology has more advanced research into leadership behaviour and it is useful in directing potential areas of interest in the field of exercise psychology. For example, sport psychology research has suggested that Chelladurai's (1978) multi-dimensional model of leadership has many characteristics that may be adopted by exercise leaders, but as of yet, this has not been tested (Biddle and Mutrie, 2008). This model is supported as it examines the leadership style in the context of the environment in which PA is delivered, and the preferences of the exercise group. In line with this, Chelladurai developed the 'Leadership Scale for Sports' (Chelladurai & Saleh, 1980) which measures dimensions of individuals' preferences in relation to the exercise leader. One such subscale is that of 'social support' which examines the exercise leader's role in encouraging interpersonal relationships within the exercise group. Despite the potential importance of such an issue, it remains untested in the exercise environment.

Even with the substantial evidence pointing towards the potential influence of exercise leaders on PA and correlates of PA, it is area that remains relatively untested in adolescent girls.

5.5.2 Class climate and exercise motivation

The class climate refers to; the tone and conditions of the PA class. It includes subjective aspects of the class, such as the motivational levels and competitive intensity. The class climate can often be set by the leader of a PA class and is thus strongly related to certain aspects of social support and leadership style / feedback. The leader of a particular group is also highly influential in developing cohesion in an exercise class or group (Carron, Hausenblas & Estabrooks, 2003). The climate set for PA may prove crucial as to whether or not an individual participates in PA (Jess & Collins, 2003). Biddle et al. (2005) reported that adolescent girls view sport and exercise as being increasingly competitive. Moreover, they reported that this population do not view keeping fit and healthy as important. This finding is not in line with FFG (Inchley et al., 2010) who reported that 72% of girls do PA to be healthy and 48% doing PA to 'feel better'. Despite these contradictory findings, it is possible that the motivation of a class, including the proposed outcomes, can potentially influence PA participation.

It has been suggested that PA in a school setting should support the development of self-regulated learners as this should aid the transference of PA into free time (Trost 2004; Fox, Cooper & McKenna, 2004). Theodosiou and Papaioannou (2006) explored the development of self-regulated learning in PE, with a particular focus on goal perspective theory. A key model in achievement motivation research is that of the goal perspective theory (Roberts, 2001). This model proposes that there are two main types of goal orientations that influence peoples thinking, feelings and actions (Theodosiou & Papaioannou, 2006). Firstly, task orientated goals which focus an individual on the processes involved in carrying out a skill. Secondly, ego orientated goals which occur when an individual's ability is compared to that of another. Ego orientation is usually competitive in form. In terms of the motivational climate that is developed in a school, research has indicated that a task orientated teaching is more likely to focus students on learning and ego orientated teaching is more likely to promote comparison and attempts to demonstrate capabilities (Treasure & Roberts, 1995). Theodosiou and Papaioannou (2006) concluded that there was a link between the climate of a PE class and achievement goals and meta-cognitive processes such as self-regulation. They suggest that research should focus more on this area.

In PE settings, there are several studies that investigate the role of goal orientations and motivational climate with students' intrinsic motivation, effort, achievement and

perceived competence (Papaioannou, 1995, 1997). Papaioannou produced the first research in the area of motivational climate and PA, developing his research from Ames and Archer's (1988) work in classroom motivational climate. Papaioannou developed the learning and performance orientation in PE classes questionnaire (LAPOPECQ). The questionnaire contains two mastery components and three performance factors and linked it to Harter's (1981) intrinsic versus extrinsic motivation orientation. Results suggest that intrinsic motivation has a positive relationship with the learning-orientated, or mastery scales, and is unrelated to the performance orientated scales. Support for a learning-orientated climate in PE has been given in numerous other studies (Ferrer-Caja & Weiss, 2000; Reeve & Deci, 1996; Biddle et al. 1995; Goudas & Biddle, 1994) and thus the potential relationship of the climate set in a school PE class and PA behaviour and correlates of PA is of particular interest to the current study.

Koka and Hein (2003) investigated the impact of teacher's feedback and learning environment on intrinsic motivation in PE in 283 high school children. They discovered that intrinsic motivation (which is linked to increased motivation to the task at hand) was enhanced by teachers who promoted positive and knowledgeable feedback and where the learning environment was promoted as non-threatening and challenging. The motivational strategies employed by PE teachers were investigated by Taylor, Ntoumanis and Smith (2009). Teachers reported that particular constraints contradicted their preferred motivational style of teaching. Such findings highlight, that whilst research may promote particular ways in which an effective motivational climate can be developed, the practicalities of implementing these recommendations are sometimes difficult. Another study conducted by Kulinna and Cothran, (2003) investigated the teaching styles of PE teachers and the subsequent perceptions of these styles. They suggest that future research should focus on gaining a deeper understanding of teaching practices in order to positively influence teaching practice and thus student learning and PA behaviour.

Out-with PE, Ryan, Connell and Deci (1985), suggested that when a teacher provides positive-information based feedback in relation to student performances, this resulted in increased perceptions of competence and in turn an increase in intrinsic motivation. Similarly, Raedeke, Focht and Scales (2007) investigated social environmental factors and psychological responses to acute exercise in adult females with social physique anxiety. A prominent finding of the study was that exercise leaders could significantly influence the quality of the exercise experience for these females by promoting either an appearance or health motivated class climate.

As well as goal orientations and modification of teacher feedback to promote autonomy and self-regulation, the climate of the class can be adapted in other ways. For example, Fox, Rejeski and Gauvin's intervention (2000) controlled the group dynamics of the class allocating participants to a socially enriched or bland class. The socially enriched class promoted a comfortable, relaxed and interactive environment, where personal interaction, encouragement and positive verbal reinforcement were promoted. In comparison, the bland class lacked warmth and interaction. Results indicated that participants exposed to the socially enriched group dynamics condition, plus the enriched leadership style, reported higher levels of enjoyment than those in the other three conditions. Interestingly, the probability of future involvement was nearly 14% higher for those in the enriched group environment, regardless of leadership style.

It has been established that there is a weak to moderate relationship between instructional leadership and exercise adherence (Bray et al, 2005). Further, it has also been suggested that the social environment or class climate created by the leader may impact on PA behaviour. Bray et al (2005) suggest that PA participation may be directly influenced by enjoyment and intention, which can potentially be manipulated by the exercise leader. Enjoyment has been identified as a positive correlate of exercise participation in female adolescents (Bungum, Dowda, Westo, Trost & Pate, 2000; Stucky-Ropp & Di Lorenzo, 1993). Enjoyment was discussed under the physical environment in relation to type and choice of activity, nonetheless, it is also pertinent to this subsection, and additionally its relationship to class climate also merits further investigation.

As well as the potential influence of the motivational climate on PA levels, cohesiveness may relate to PA in the school environment. Cohesion refers to an individual's perception that all members of team are directed and motivated towards the same goals (Blanchard, Amiot, Perreault, Vallerand & Provencher, 2009). It has been linked with motivation and performance within teams in sport, occupational and educational settings (Lent, Schmidt & Schmidt, 2006). Consequently, feelings of cohesion among adolescents in their PE class may influence individual and team perceptions of motivation and in turn levels of participation. However, this is purely speculative as research in relation to PA and cohesion is limited to the sport environment with no known previous literature relating to school PE.

5.5.3 Class composition

The composition of a PA class refers to the objective components of the class and includes aspects such as size, ability level and sex and it is highly possible that these factors may have an effect on PA levels.

Sex

Traditionally, PE in Scotland has been taught in mixed sex and mixed ability classes and it is possible that this may influence activity levels. FFG (Inchley et al., 2010) reported that 37% of girls showed a preference for single sex PE classes. Previous research has indicated that co-educational classes are not an appropriate environment for some pupils (Garcia, 1994, Sadker & Sadker, 1994). Further, Sadker and Sadker (1994), investigated a number of PE environments and reported that teachers tended to be biased against girls and that boys received greater attention in relation to teacher feedback. In addition, Griffin (1985), examined the dynamics of mixed sex PE classes and found that the environment was not as conducive for learning for girls and low skilled boys, as for boys who were competent; the more competent boys were found to harass students verbally and intimidate them physically.

Girls reported higher levels of activity (Moderate Vigorous Physical Activity - MVPA) in single-sex PE classes in McKenzie and colleague's M-SPAN research (McKenzie, Prochaska, Sallis & LaMaster, 2004). However, a further study examining the relationship between PE class make up in relation to a number of variables (field site, lesson context and location, teacher gender, and class gender composition), was the Trial of Activity for Adolescent Girls (TAAG) study (Homas, et al., 2006). Using the System for Observing Fitness Instruction Time (SOFIT), baseline data were collected 36 US middle schools, the data did not reveal a difference in time spent in vigorous and moderate PA according to class gender composition. Results indicated that coeducational lessons were longer (by 7.9 minutes) than girls only lessons and provided more MVPA time and greater energy expenditure. Whilst these findings are important for the consideration of creating an appropriate environment for PE, a criticism of each of these studies is that MVPA is the dominant determinant, in recommending whether PE classes should be single or mixed sex. It could be suggested that the relationship is more complex than some studies are reporting, and the topic requires deeper consideration of social and psychological factors associated with this issue.

In their investigation into the topic, Derry and Phillips (2004) highlighted that girls are more exposed to ineffective learning within mixed sex PE classes because of gender role stereotypes, sexism, harassment and secondary sexual characteristics' development. Derry and Phillips examined particular student and teacher behaviours in single sex and coeducational PE. Results indicated that there was some evidence to support a single-sex environment as a more positive learning environment for adolescent girls. The variables of engaged skill learning time and student-initiated interactions were significantly associated with a single sex class. Indeed, girls were reported to have spent 47.3% more time in skill learning or active participation than girls in coeducational classes. A single sex environment also encouraged interaction and communication between girls and their female PE teacher than in mixed sex classes. However, Derry and Phillips found no significant differences between class type on the variables; enjoyment, global self-worth and perceived physical competence. They reported that low participant numbers could be responsible for the lack of significance, or that these variables are not as important to girls in adolescents as perhaps in later adulthood. However, other information presented in the current thesis would argue that these variables are important to adolescents (Biddle, et al. 2005). Nonetheless, Derry and Phillip's suggestion that further research into the value adolescent girls place on their PE experiences and how these values potentially change over the course of their school career and into adulthood, is supported.

Size

The size of a group has been of interest to group dynamics researchers in a variety of settings (e.g. business and education), and indeed size has shown to be influential on psychological and social variables in these settings (Carron, 1990). Class size, in relation to PA, has also received some attention; Carron, Brawley and Widmeyer (1990), investigated adherence behaviour in university PA classes. The researchers appointed PA classes of varying sizes to one of four groups; small (from 5-17 members), medium (from 18-26 members), moderately large classes (from 27-31) members and large (from 32 to 46 members). It was reported that the small and large classes had the highest number of adherers to the classes and the highest rates of retention. It is worth noting that the classification of the classes, into each of the group in terms of number of members is not equal and this may have implications for interpreting the results.

In a follow up to Carron et al's (1990) study, Remers, Widmeyer and Williams (1995), examined the effects of group size on adherence and perceived exertion in both medium

(18-26 members) and large classes (70 to 90 members). Their findings reflected those of Carron et al., (1990) and reported higher adherence and perceived exertion in the larger class; however, the reasons for this were not examined.

In contrast to the findings of Carron et al. (1990), and Remers et al. (1995), research out with the exercise domain has indicated that increasing group size generally leads to negative effects on group member perceptions (Carron & Hausenblas, 1998). Group members highlighted the positive aspects of increasing group size as; an increase in the number of resources for group tasks, greater opportunity for social interaction and to meet interesting and appealing individuals. Out with these benefits, group members did not report advantages of increases group size. In contrast to these findings, the aforementioned M-SPAN baseline data reported no significant difference on any of the variables measured according to class size.

A further study examining exercise preferences in relation to size and structure was conducted by Burke, Carron and Eys (2006). They investigated the preferred PA contexts of male and female university students. The study sought to determine the least and most preferable PA forums across four contexts: a) exercising in a structured class b) exercising with others outside of a structured class setting c) exercising on one's own in an exercise setting and d) exercising completely alone. The study investigated these contexts across aerobic activity and weight training. Results showed that exercising with others outside a structured class setting was the most preferable context for both males and females. Exercising completely alone was identified as the least favourable PA context for significantly more females than the other three contexts. To some extent, these findings contradict previous research that reported a preference for females to exercise alone (Wilcox et al 1999). It is explained that rather than offering a dichotomy of exercise contexts i.e. exercising in a structured / class setting or exercising along, Burke and colleagues offered more and realistic contexts for participants to choose from. It is possible that these results are more reliable than previous research that indicates that females like to exercise alone and supports previous research that indicates a large number of people do not enjoy structured exercise classes (King, Taylor, Haskell, & DeBusk, 1990, Wilcox et al, 1999).

Ability

The FFG study (2008, pp 23) indicated that in a case study where girls of a similar weight and size were grouped together there was less of a threat of failure and the participants reported a sense of support for each other. FFG (Inchley et al., 2010) has also highlighted that 44% of girls cited lack of skill and 35% cited feeling embarrassed as barriers to PA. Such finding points towards the potential importance the make-up an exercise environment may have on both exercise behaviour and cognitions.

5.6 Summary and Rationale

The current literature review has highlighted that there are a large number of environmental influences on PA behaviour and that for the current intervention, aspects of the physical and social environment associated with school PE are of particular interest. Table 5.1 summarises the factors considered under these headings and illustrates that the environment can be reviewed across two main categories; the physical and social.

Table 5.1: Summary of environmental factors associated with physical activity

Main component	Sub-component
Physical environment (<i>material objects and facilities present in an environment</i>).	♦ School built environment
	♦ Built environment and facilities in the community
	♦ Weather
	♦ Type and choice of activity
	♦ Quantity and timing of PA
Social environment (<i>environmental conditions created out-with material objects</i>).	♦ Class climate and exercise motivation (<i>intangible aspects of the environment</i>)
	♦ Class composition (<i>tangible aspects of the environment</i>) <ul style="list-style-type: none">• Sex• Size• Ability
	♦ Social support: <ul style="list-style-type: none">• Family support• Peer support• Teacher and exercise leader support

Within this chapter, it has been identified that there is a lack of understanding about the precise requirements that adolescent females in Scotland have for both their social and physical environments, specifically within the context of school PE. Phongaran et al

(2007) indicated that all too often the exercise environment that has been created for a particular population has perhaps not targeted the specific needs of that very group. In essence, a 'one size fits all' approach to the PA environment will not be effective, and thus, investigation regarding the target population is necessary.

In her investigation into the reasons pupils are encouraged or discouraged from taking part in Higher PE in Scotland, MacPhail (2002) supports giving students 'a voice' in order to understand their decisions in greater detail. FFG (Inchley et al., 2010) has reported that under half (43%) of teenage girls in Scotland are consulted about what physical activities they would like to do at school. In line with this, Hohepa et al. (2006) suggested that consulting with adolescents regarding their PA preferences, may improve the effectiveness of PA interventions.

Humpel and colleagues (2002) recommended that future research investigating the role of the environment should be targeted at specific behaviours. Giles- Corti and colleagues (2005), took these recommendations and proposed that future research should be much more specific to both PA behaviours and contexts. They suggest that, rather than investigating; 'walking in the neighbourhood', it would be more effective to investigate; 'walking for transport or walking for leisure in the neighbourhood'. With these recommendations in mind, this study will make specific reference to school PE in the school environment in relation to Scottish adolescent girls aged 13-16.

The aim of the current study is to highlight and explore the social and physical environmental factors that adolescent girls in Edinburgh and East Lothian perceive as important to being physically active in school PE and that may influence PA participation. Based on the literature review, this aim falls across four key sub-sections:

- Physical Environment
- Social Environment
- Social Support
- Characteristics and Behaviours of exercise leaders

5.7 Methodology

5.7.1 Participants and context

Two local secondary schools were invited to take part in the study and consent was obtained from the head teacher and local authorities. There was no obligation on the schools to participate in the project.

The researcher met with the pupils during PE to give an overview and highlight the requirements of the research. The researcher highlighted that it was not compulsory to take part and that all information gathered would be treated as confidential. An information sheet, caregiver consent form and participant consent form (Appendix H) was distributed to all S4 girls present on the day, in each school (n=218). Once signed consent forms were returned, participants were asked to answer recognised PA questions, in order to establish the populations PA levels, (Prochaska, Sallis & Long, 2001) (Appendix I) and return these to the researcher. Assessment of level of PA was used as screening so that participants could be grouped with girls of the same activity level as it was anticipated that they would be more comfortable talking about issues of a potentially sensitive nature amongst those with similar activity levels (Emslie et al., 2007). Once the questions were used to identify the sample, the information was not used again and was stored securely.

The study recruited 38 participants (age 13-16), 12 of whom were identified themselves as high active, 13 moderately active and 13 low active. Despite the intention to group participants according to their activity level logistically this was not possible and so there was an occasion where 2 'high active' participants were grouped with 'moderately active' participants. There were 8 focus groups with 4-7 participants in each group. No participants withdrew from the study. Girls were allocated to a group based on their self-reported PA measures and feasibility in relation to class timetabling. The sample size and grouping are in line with research carried out with a similar population (Hoepa, Schofield & Kolt, 2006) and in line with general focus group guidelines (Barbour & Kitzenger, 1999). Additionally, qualitative investigation considers in-depth involvement with participants as a greater priority than wide spread sampling (McKenna & Mutrie, 2003).

5.7.2 Instrument

Focus Groups

Focus groups were used to gather information relating to the PA environment in school. The researcher was trained in focus group moderation and utilised the necessary skills to the best of her ability to ensure that participants felt comfortable at all times. Qualitative enquiry stresses the importance of showing respect to both the participants and the data that they provide, included in this is the development of a rapport with the participants and this was something that the researcher endeavoured to create with each individual. During focus groups, ideas can be developed through interactive discussion, something that is not possible during individual interviews.

Focus group schedule

The literature review shaped the development of the focus group schedule; specifically, 5 main themes (i.e., physical features of the exercise environment and changing facilities, social support, leader support, class climate and class composition) were used in the focus group schedule (Appendix J). The schedule was applied as a guide, rather than to direct discussion. Broad open-ended questions were used in order to promote as much conversation as possible and to retrieve as much data as was feasible. Further, probes were used around each main theme and aids such as paper and pens for specific exercise and PA quotes were used in order to encourage participation and to stimulate discussion. Participants were asked to conduct tasks such as ‘create your ideal exercise leader’ and ‘design your ideal PA environment’.

The schedule was piloted on a team of researchers and amendments were made in line with feedback. Following this, the schedule was piloted on recruited participants and recorded. The recording was assessed by the primary supervisor and specific feedback in relation to the co-ordination and questioning, indicated that the focus group was successful, but that the researcher should ensure participants are given the opportunity to respond, and the researcher should be wary of leading the respondents. Despite these minor areas for improvement, the quality of the focus groups was deemed appropriate for use in the final analysis. No adjustments were made to the initial focus groups schedule.

5.7.3 Procedure

A total of eight focus groups were conducted. Each focus group was carried out in a private classroom in the schools, and at a time that was suitable for the schools and pupils. The focus groups took place over two, one month periods (June and September). The interviews lasted between 45 and 71 (mean=56) minutes. Before each focus group, the participants were reminded that they did not have to take part and that they were free to withdraw at any time. The participants sat around a table with the researcher in the middle. A series of ground rules were set by the participants and researcher immediately before the focus group discussion began. Issues of trust and mutual respect were raised at this point. All participants verbally agreed with the ground rules formulated. The focus groups were audio recorded using a digital voice recorder and the data were downloaded onto a password protected computer for transcription and analysis. The researcher had an assistant who took notes to aid the analysis process and assisted with any arising technical issues during the focus groups.

5.7.4 Data analysis

Identification of meaning units

The focus groups were taped and transcribed verbatim to ensure that all discussion points were captured, a sample transcript is provided in the appendix (Appendix K). The researcher read through the transcripts several times in order to re-familiarize herself with the data and to obtain a general idea about potential emergent and significant themes (Crossley, 2000). A computer software package (Nvivo 8) was used to assist with data management, sorting and retrieval.

Two researchers met in order to identify meaningful units and themes. These were agreed through discussion and guidance from the literature review and other relevant literature (Graneheim & Lundman, 2004; Gibbs, 2007; Tesch, 1990). Criteria for identifying meaning units followed Graneheim and Lundman's definition: 'words, sentences or paragraphs containing aspects related to each other through their content and context (p.106) (Graneheim & Lundman, 2004). This was used as a guide rather than as a rigid rule, and often the researchers felt it necessary to include more information in a meaning unit than less, in order to gain as much insight into the area as possible.

Data Organisation

As well as literature guiding the focus group schedule, early transcription analysis and research meetings indicated that there were two clear emerging themes: the physical environment and social environment. Further, within the context of the social environment 3 sub categories were identified: class climate, class composition and characteristics and behaviours of exercise leaders. For this reason, the data was organized into these two main themes and 3 sub-themes for further analysis.

Inductive content analysis

There are a number of approaches to conducting a qualitative analysis and guidelines suggest that the strategy employed should reflect the purpose of the study (Krane, Andersen, & Streaan, 1997). Accordingly, after identification of the two main themes, and appropriate sub-themes, inductive content analysis was carried out on the data within each theme, with procedural guidance from Smith (1997). Inductive analysis is generally data driven coding, whereby the researcher develops themes with an open mind and view point. Analysis sought to capture the participant's meanings and produce the raw data in to a coherent and manageable form to increase knowledge relating to the perceived role of the environment on adolescent girls' PA.

Analysis used a constant comparison method whereby meaning units were compared and clustered together if they had similar meaning. The initial analysis organised meaning units with similar implications into clusters and these were termed first order themes, meaning units could be assigned to more than one theme. Relationships between these first order themes were then identified and themes with similar meaning were clustered together and in turn, second order themes emerged and were subsequently labeled. This process was inductive in form, and continued until no further groupings could be made, and second and third order themes had emerged. In some instances, there were no emergent second or third order themes and, first order themes were directly linked to the general themes, third order themes, sub themes or main themes. The emergence of each theme was agreed upon, through discussion, by the researchers. Figure 5.1 provides an illustration of the analysis process.

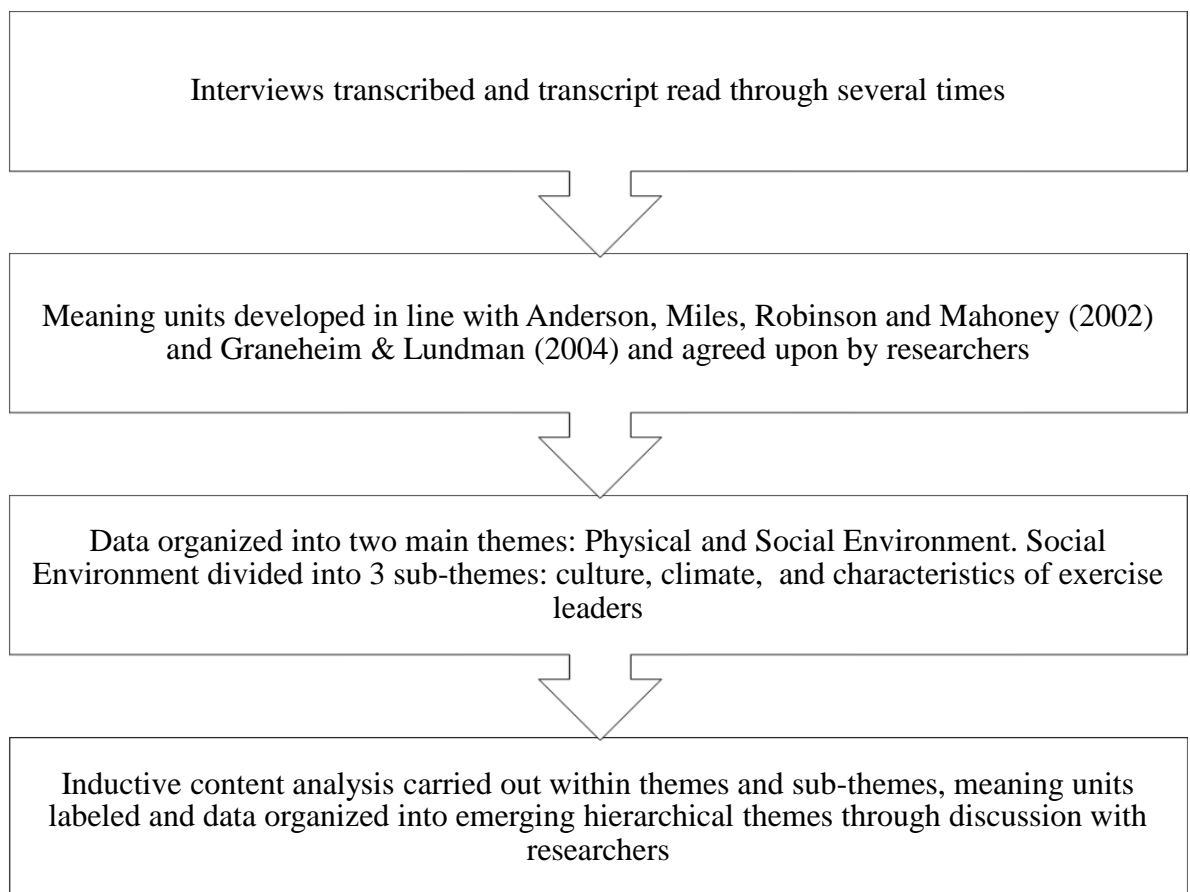


Figure 5.1: Data Analysis Process for Study 2.

Trustworthiness of the data

In order to establish the reliability of the research, the researcher consulted with her PhD supervisor on a regular bases in the development of meaning units, the first two focus groups were coded separately by the researchers and coding was compared and discussed until agreement was met (κ score ≥ 0.80). Following this, the researchers then analysed two further focus groups together whereby a κ score of ≥ 0.80 was achieved to insure inter-rater reliability. The final four focus groups were analysed by the primary researcher, who carried out intra-rater reliability checks, until agreement was met (κ score ≥ 0.80). In addition to the categorisation of themes, this process assisted the primary researcher in exploring and critically questioning her decisions during the analytic process (Lincoln & Guba, 1985).

In order to further increase the trustworthiness of the data a third researcher was involved in ‘peer debriefing’ (Lincoln & Guba, 1985). The researcher’s secondary researcher acted as a disinterested peer who had no previous involvement in the analysis process, but had a

level of knowledge about the topic which enabled her to contribute appropriately. Peer debriefing occurred after the analysis of four focus groups and enabled the researcher to critically appraise her research decisions and to reflect on future directions. It thus increased the researcher's confidence in her research decisions and enabled her to proceed with further analysis with a clear mind (Lincoln & Gruba, 1985). A final means employed to increase the trustworthiness of the data and in line with action research, was through the researcher's reflective diary. As well as action-research reflections, the researcher noted methodological decisions made throughout the research. The researcher also referred back to the transcripts in order to sure that thematic connections were suitable. The researcher also used quotations from the original data to demonstrate their source. Using quotes and pseudonyms enabled the researcher to illustrate the findings and 'bring them to life'.

5.8 Results

Overview

The results presented are the collective responses of all eight focus groups. The interview transcripts yielded 1232 meaning units. Nvivo calculated the number of meaning units and number of focus groups mentioning each theme was noted for every theme that emerged. However, frequency counts were not included because of the problem of misrepresenting the importance of each theme (Krane, Andersen & Streaan, 1997).

Each theme is presented by both text and diagrams. Each of the diagrams presented are hierarchical in nature, and Figure 5.2 provides a key to each of the diagrammatical representations of the results. The overall theme refers to the general term 'environment' into which all data emerged, main themes refer to the themes in which data were organised (physical and social environment), sub-themes refer to further data organisation which was present within the main theme; social environment. The development of first, second and third order themes was discussed in the analysis section. It should be noted that not all themes are isolated; there are several instances where themes overlap and interlink with each other.

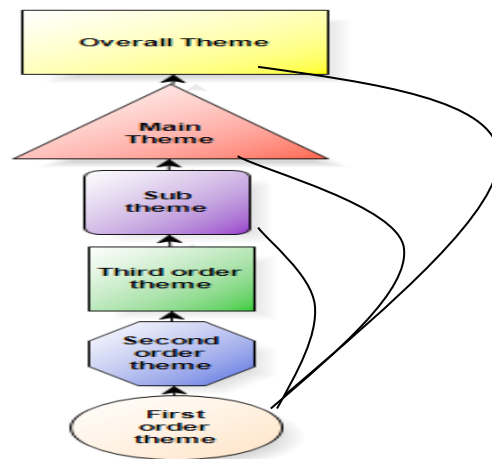


Figure 5.2: Diagram Key: Development of Themes

The key aim of the study was to identify the environmental factors adolescent females perceived as influencing PA; each theme identified can be interpreted as such. To improve organisation and coherence of the data within the themes ‘characteristics and behaviours of exercise leaders’ and ‘class climate’ the second order themes were all labeled as positive characteristics. Ideally, analysis would have enabled the presentation of results to identify the optimal environment for PA across each main theme. However, not all themes could be presented in this manner and therefore, the physical environment and class composition are purely descriptive in form.

Figure 5.3 illustrates that the data yielded two main themes; physical and social environment and three sub-themes of the social environment: class composition, class climate and characteristics and behaviours of exercise leaders.

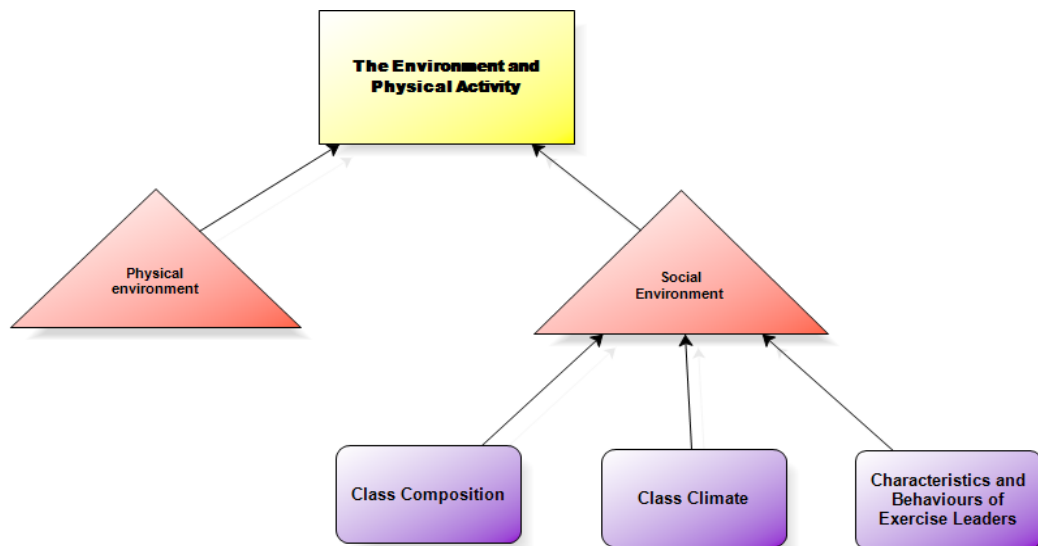


Figure 5.3: Overview of main themes: Physical and social environment and sub themes of the social environmental; class composition, class climate and characteristics and behaviours of exercise leaders.

5.8.1 Main Theme: Physical environment

The theme ‘Physical Environment’ was defined as; ‘material objects and facilities present in an environment’ (Humpel, Owen and Leslie, 2002). It also included the actual PA pursuit being carried out. The results are presented in diagrammatic format according to the themes identified and follow the key presented in figure 5.2. Figure 5.4 provides an overview of the themes emerging under the general theme of physical environment. It illustrates that there were 28 first order themes, 6 second order themes and 2 third order themes.

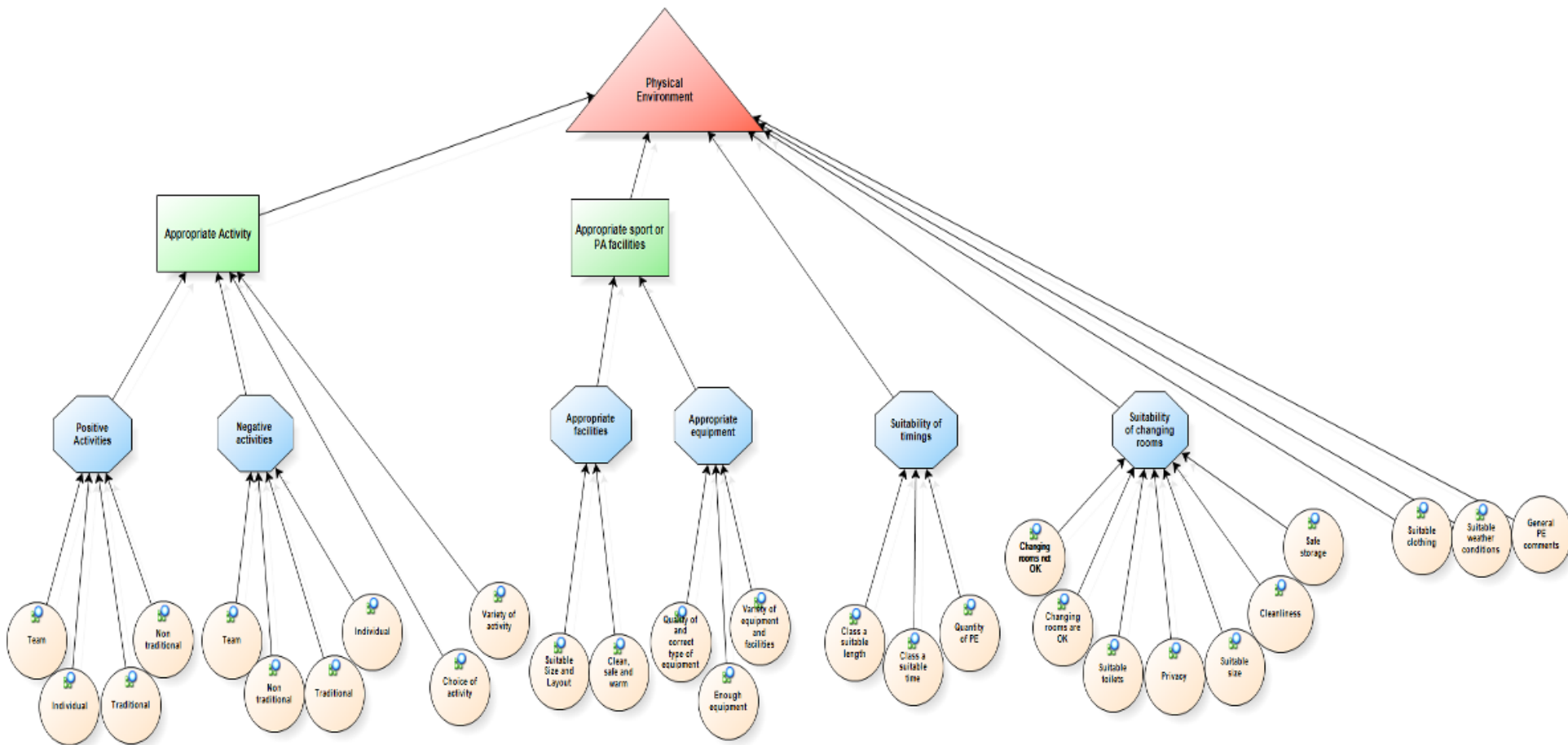


Figure 5.4: Main theme: Physical Environment

Hierarchical structure of third order theme: Appropriate activity

This theme incorporated all suggestions related to the actual activities offered or carried out during PE. Figure 5.4 illustrates the emergence of 10 first order and two second order themes, into the third order theme, ‘appropriate activity’.

Positive activities

The ‘positive activities’ theme contained meaning units that made a positive reference to any PA carried out.

Team (positive)

This theme emerged from participants’ suggestions that some team activities (i.e. hockey, football) were viewed positively. For example, Julie enjoyed hockey: “I really enjoy hockey and we can’t do hockey now...” Similarly, Kate liked basketball: “I do basketball cos it’s really relaxing, it’s good for your fitness, but it’s relaxing especially when it’s last thing on a Friday.” There were several team activities viewed positively by participants, however, no one team activity was reported as more enjoyable than another.

Individual (positive)

This theme emerged from positive comments relating to individual PA pursuits (i.e. running, the gym). A discussion between Catriona, Anna and Cheryl highlighted that the girls enjoyed individual activities such as the gym:

Catriona: My friend’s school’s got like just two gyms and they’ve got treadmills, and running machines and cycling machines and stuff.

Anna: I love the gym.

Cheryl: It would be good if they had stuff like that.

In addition to the gym, running and dance were also identified as individual activities that the girls enjoyed.

Traditional (positive)

This theme emerged from positive comments relating to sports termed traditional (e.g. hockey, netball, football and rugby). Traditional team sports such as basketball, hockey

and football were positively received by several girls. The girls tended to identify the activities they enjoyed, however they did not elaborate greatly on their reasons for enjoying them. There were a few comments made in relation to the type of activity and the composition of the class. For example, Sarah noted that for a traditional activity such as football, she felt it could be improved if it was a girls only class: “I like football but all the guys do it so you don’t like to do it, I wish there was a girls football or something...so only girls could do it.” In this instance Sarah enjoyed the actual activity; however the composition of the class had an impact on this enjoyment. ‘Class composition’ is presented in full under the theme social environment

Nontraditional (positive)

Some nontraditional sports (e.g. fitness suite activities, dance and team building) were identified as positive activities that participants enjoyed. For example, Lee commented:

It’s quite fun cos sometimes you don’t actually want to do a sport like don’t want to go out and play rounders or anything, but you quite fancy a wee run or something, but it would be good to go on the treadmill or something.

As with a previous theme, the gym and unstructured outdoor running were both supported by pupils.

Team building activities were viewed positively by participants such as Ellen who recalled a time she took part in team building: “Well there was this one time, like for fun we got these, like, little skateboards and we went round the room on them but you still played game on it and there were these big bouncy balls and that...” In general, team building was viewed extremely positively by pupils, however, it was acknowledged that they didn’t participate in it very often.

Negative activities

This theme emerged from negative comments relating to any PA carried out.

Team (negative)

This theme included comments that made reference to any team activities in a negative manner. There were no meaning units that explicitly referred to a lack of enjoyment in relation to a particular team activities format or content. In all instances where a team

activity was referred to in a negative manner, it was stated that the reason for not enjoying the team activity was not a result of the nature of the activity itself, but for additional reasons, all of which were labeled under the main theme 'social environment'. Such an example was given by Tina who indicated that football was not enjoyable for her because there were boys in her class:

We also get the choice of football but not very many girls take it because half the boys go and they get really competitive, and if you had like girls football then you would probably get a few more girls doing football...

It can be seen that the activity itself is not the issue, but rather, the composition of the class, which will be discussed under the sub-theme 'class composition'.

Individual (negative)

The 'individual (negative)' theme contained meaning units that convey a negative message in relation to individual physical activities. For example, Andrea did not enjoy dancing and stated: "But also if you don't do dancing at all, for most people it's the worst kind of thing you can do in PE." Dancing was referred to several times as an activity that attracted, and was viewed positively by, girls who were good at dancing and took part dancing as an extra-curricular activity, but for those who didn't take part in dancing regularly they viewed it as a negative activity, as explained by Louise:

A lot of people don't do it, and you're asked to make up your own moves and people are like what's a move kind of thing? Like some girls go to dance and go to quite good dance things and they can show off and other people feel, oh what can we do? And can we copy it? And you feel a wee bit out of place...

In addition to dance, badminton was highlighted as an activity that participants did not enjoy, as mentioned by Mandy: "I'm the same as Kirsty, I don't really like badminton cos it's sometimes really boring." Whilst badminton and dance were both highlighted as individual activities that were sometimes negatively received, the responses did not indicate that participants had a preference, or dislike, for team sports over individual sports or vice versa.

Traditional (negative)

This theme related to traditional physical activities (e.g. football, hockey, basketball and swimming) which were referred to in a negative manner. Swimming was identified as a negative activity by several participants including Jade who explained why she did not enjoy it: “everyone is embarrassed, if you’re in like a pure bikini or whatever in front of boys that are in your class that you’re going to see every day after that...” Other activities that were viewed in a negative manner were football, badminton and the bleep test and the reasons for this varied. As with other themes, the reasons why specific traditional activities were viewed negatively were more appropriately labelled in the social environment section and are thus presented under this theme.

Nontraditional (negative)

This theme emerged from comments that related to nontraditional activities (e.g. dance, yoga and gym work), being talked about in a negative manner. Beth indicated that she did not enjoy some of these activities: “Well I don’t want to do pilates and yoga”. Similarly, Jude, indicated that when teachers had made an attempt to modernise and adapt more traditional activities they were not well received: “So you stick, if someone tigs you, you stick your hand out and someone has to flush it and you’re back in the game...and no one wants to do that in like fourth year cos it’s just embarrassing.” In this instance tig had been adapted to ‘toilet tig’ and Jude and her classmates had felt that it was too immature for their age group. As with team and individual activities, there was no outstanding preference, or lack thereof, for participants to take part in traditional over nontraditional activities or vice versa.

Additional first order themes

Variety of activity

This theme was defined as; ‘the different forms and types of activities appreciated by participants’. The theme emerged from the girls’ comments in relation to their preferences for a combination of various types of activity. For example, Lucy enjoyed activities that were both competitive and non-competitive:

Certain times, like when we play rounders or summer games you want it just to be fun, but there are other times you want to be competitive like if you play basketball or that you want to try and win from the other time.

Lucy mentioned that sometimes she was happy to take part in an activity just for fun, but sometimes she preferred the more competitive element of an activity. This relates to the main theme 'social environment', specifically under the theme 'class climate', where competition is presented in more detail. As well as a mixture of competitive activities, participants reported that variety, in terms of team and individual activities, was important. This was something Anna believed in and she suggested that a PE class should: "Have team activities, but have sometimes individual activities as well". Further, participants felt that taking part in the same activities for PE all the time could become repetitive and boring. Consequently, they felt that a variety of team and individual, and competitive and non competitive, were necessary to combat this.

Choice of activity

This theme referred to the ability to choose what PA to take part in. There was a lot of discussion around this theme. Alice discussed the process of activity selection in her school:

I think it's getting better, it's better when you can pick your own subjects, like, like certain things used to always appear, like swimming used to appear in every column, whereas they've changed that now so we don't have to do swimming, but, I think we should get a choice, and cos everything's not done individually, you've got groups of things you want to do, and sometimes you've got groups of things you get things you like swimming's in nearly all of them.

Alice felt that the process of choosing activities and the choice of activities in her school had improved. However, Alice also reported that the programmes that were developed were not individualised meaning she had to take part in some activities that she did not enjoy. Rachel also described activity selection in her school:

At the start of the year everybody in the year goes into the big hall and there's loads of stuff round the room and each things got a couple of different activities on it and if there's nothing there that you like, then you're like, oh god I've got a whole year of this and it just makes you not want to do PE the whole year, cos you're stuck doing something you don't want to do...

For Rachel, whilst she was offered an opportunity to pick her own subject, the variety of activities available did not necessarily fit her preferences. As a result, she reported a feeling of dread at the prospect of taking part in PE for the whole year.

Julie described why she felt it was important to be able to choose activities that she enjoyed:

It's like important that you pick your own activity, cos then at least people are still getting to be healthy, instead of like...cos they're saying you've to do the hour a week, still people are still not doing it because they're not happy with what they've been given to do.

Julie felt that it was important for people to have suitable options for PE in order to ensure participation. She reported that when people were not satisfied with the selection of activities then they were unlikely to participate. This was a view that was shared by Lisa:

No, but if you want to be active you're not going to it if you get made to do something you don't want to do...that will just put you off doing it anyway...off doing it altogether.

Lisa felt that mandatory participation in certain activities was detrimental to her motivation to be active. Similarly, Jude felt that teachers should avoid compulsory activities:

Ask what they want to do and then try and improvise if you get what I mean, so they're taking part as well, cos if you're doing something you want to do, you'll want to do PE more than if you're doing something that you actually despise. You're like I can't be bothered today, if you get what I mean...

Jude felt teachers should improvise and adapt on popular activities to ensure maximum participation. Jude felt that this would be more productive than forcing people to take part in activities they did not enjoy. Overall pupils felt that they should be able to choose the activities they take part in for PE. Pupils did not feel it was productive to force them into set activities as they were then less motivated to take part.

Hierarchical structure of third order theme: Appropriate sport or PA resources

This third order theme referred to the availability of appropriate sport or PA resources for assisting PA, specifically, the provision of PA opportunities and equipment. Figure 5.4 illustrates that five first order themes clustered into two second order themes; ‘appropriate facilities’ and ‘appropriate equipment’. Subsequently these merged into the overall theme; ‘physical environment’.

Appropriate facilities

This theme referred to the appropriateness of the location in which the participants were physically active, e.g. a gym hall or playing field. Figure 5.4 illustrates that it was developed from two first order themes: ‘suitable size and Layout’ and ‘clean, warm and safe’.

Suitable size and layout

This first order theme related to the suitability of the size and layout of the environment and whether or not it is conducive to PA. Participants reported that the size of their PA environment could have an impact on their PA experiences, as explained by Louise, Rhona and Sarah:

Louise: It’s too crowded and nobody can actually do anything.

Rhona: Yeah, it’s quite narrow so you can’t really play a lot of games.

Sarah: Sometimes there are a lot of people and you can’t actually do anything because it’s too small...it’s too crowded.

These participants indicated that a poorly sized PA environment reduced opportunities to be physically active. Another student, Yvonne, believed that the size of a room could impact on the perceived effectiveness of an activity: “Like a size of a room can make an activity good or it can make it not as good.” Yvonne highlighted that the size of the PA environment could determine whether Participants view an activity positively or negatively.

The layout of a classroom was mentioned by participants such as Ashley; Ashley did not like having a dance studio with mirrors:

Yeah as well and like if you're doing it, you know how there's the big mirrors and stuff you can see them behind you making comments and staring at you and that just makes you muck up even more so you then you make a bigger idiot of yourself and then they slag you even more...so you get all...

Ashley identified that the design of a PA environment could have an impact on her competence and confidence in an activity. She mentioned that having mirrors in the dance studio could create more opportunities for negative comments to be made about her ability. The impact of negative comments made by others will be discussed in more detail in the sub-theme 'class climate'. Overall, a class that was a suitable size and layout was reported as a valuable feature of the PA environment.

Clean, warm and safe

This theme referred to participants' feelings that their facilities should be clean, safe and warm. Lizzy and Anna discussed the impact that an inadequately heated room had on them:

Lizzy: You dinnae want to do it, you just want to sit.

Anna: You dinnae want to go in.

Lizzy and Anna indicated that they were put off entering the gym hall when it is cold. Similarly, Rachel, pointed out that if the gym hall is dirty then participants are put off taking part:

Well I agree with it, cos you're aren't exactly going to want to go outside and do PE when it's like been raining a couple days and it's all kind of muddy, and it's just the same inside and when you're inside you expect it to be cleaner as well.

These statements suggest that if the facilities are not suitably clean and warm then participant's desire to take part in PE is reduced. Finally, it was highlighted that participants felt that the gym halls were sometimes unsafe because the floors were slippery, this also reduced motivation to participate. A warm, safe and clean PA environment was highlighted as an important feature of the physical environment.

Appropriate equipment

The ‘appropriate equipment’ theme referred to apparatus conducive to PA, e.g. enough hockey sticks or footballs. Figure 5.4 illustrates that this theme emerged from three first order themes.

Quality and correct type of equipment

Several participants identified that it was necessary to have equipment that is good quality and that is suitable for the activity being carried out. Two participants, Lindsay and Helen, indicated that not having equipment of a certain standard impacted on their concentration and perception of fairness during an activity:

Lindsay: It just means you’re concentrating on who’s got the better equipment rather than on the game.

Helen: Yeah like if it’s two team things and there’s two balls and one is really good and one is rubbish and you’ve got the rubbish one they’re going to be better and it’s not going to be very fair.

Lindsay and Helen indicated that it was unfair for one group to have better equipment than another. This was echoed by Fiona, who suggested that poor equipment could inhibit people’s abilities and cause unrest between class members: “Cos if you’re left with rubbish ones or ones that don’t work properly and then that stops you fae playing as best you could. Other people just shout and moan at you and it’s not enjoyable.” Fiona pointed out that equipment issues can lead to unrest between class members. In turn, it is implied that this can impact on the enjoyment of the class. Enjoyment of the PE class is presented in detail under the theme ‘class climate’. Participants felt that equipment of a suitable quality was significant in a PE environment.

Enough equipment

This theme is defined as ‘having enough equipment of the same quality to go around the class’. Not having enough equipment was discussed by Lucy, Emma and Jade:

Lucy: You just have to get mats and you feel...

Emma: It’s not very fair on the people who don’t have proper stuff...

Jade: Singled out.

Emma: They get left out and some people just take over some things...

Lucy: ...and they feel embarrassed of having something different...

These girls highlighted that individuals possibly felt uncomfortable, embarrassed and singled out if they did not have the same equipment as other participants. It was suggested that some individuals took over when there was insufficient equipment which resulted in other individuals not being involved as they should be. Additionally, Kate explained that she found not having enough equipment frustrating:

Cos for a start it's too small the whole room, but, cos it gets boring doing the same things every time you go in and there's not enough equipment either...there's too many of us in the one room, and everyone has to wait on a machine and it's so annoying.

Kate highlighted that pupils could become irritated if they were waiting on equipment, especially if the class size was too big for the facility. Other participants indicated that a PA class could be boring if there was not enough equipment. Overall, enough equipment was viewed as an important factor in a PA class.

Variety of equipment and facilities

It emerged that participants perceived a variety of PA equipment as important. For example, Carole, Gail and Susie discussed the variety of equipment available in a gym:

Carole: I love the gym.

Gail: It would be good if they had stuff like that.

Carole: The cross trainer and everything, weights and just like everything, the bike...

Susie: It's quite fun because sometimes you don't actually want to do a sport, like, don't want to go out and play rounders or anything, but you quite fancy a wee run or something, but it would be good to go on the treadmill or something

Carole, Gail and Susie indicated that a variety of equipment was viewed in a positive manner. The implications and reasons for this are speculative, but Susie suggests that her PA preference is dependent on her mood. Overall, a variety of equipment was reported as a positive aspect of the physical environment.

Hierarchical structure of second order theme: Suitability of timings of PA

Figure 5.4 illustrates that several second order themes developed hierarchically from first order themes and emerged directly into the overall theme without progressing into third order themes. The second order theme 'suitability of timings of PA' referred to aspects of length, quantity and timing of PE that the girls felt contributed to their physical environment. It emerged from three first order themes (Figure 5.4).

Length of class

This theme referred to the length of time a PA class lasts. Several participants believed that their PE class was not long enough, this was highlighted by Laura who commented: "Yeah because people who didn't pick PE only get an hour a week and that's not a lot of time". Participants such as Amy felt that short periods prevented her from going to off campus facilities:

We got a new timetable change not that long ago and like we only get an hour for every period, so now we don't like get double PE, which we used to have, so we used to have like an hour and thirty five minutes, but it's now all changed and we've only got an hour for every period, an only get an hour for PE, so now we can't use (facility), so now we can't do athletics or hockey or anything, we can only like do it here...

Amy drew attention to the fact that not having enough time in the lesson to encompass travel to a particular facility limited the activities available to the class.

When participants were asked how long a PE class should be, several suggested that 2 hours would be the optimal length. This was discussed by Angela, Nora, and Megan:

Angela: About 2 hours long.

Nora: 2 hours a period.

Megan: About 2 hours for every period of PE.

Researcher: Does that include getting changed?

Angela: Yeah, like 2 hours for the whole thing.

Overall, a class that was a suitable length was something that participants felt was important to the overall physical make-up of the class, with two hours being suggested as the optimal length.

Class a suitable time:

This theme referred to the time of day participants have their PA class. Penny, Jenna and Shona explained why they felt that having their PA class at a suitable time was important:

Penny: Cos if you have it first thing then you're going to be all tired and you don't want to get all hot and sweaty and then you'll feel horrible all day, but if you have it last you wouldn't really care cos you can just go home.

Researcher: Do you think you would be more active if you had it last ?

Jenna: Yeah, cos we used to have it last when we were in second year and I think everyone in my class used to be...but now it's like first thing in the morning.

Shona: It was better as well cos you could do it for longer cos you didn't need to worry about being late for your next class.

The girls indicated that it was important for them to be comfortable after being physically active. They also stressed that it was necessary for them to have appropriate time to get changed after being physically active in order to reduce the likelihood of being late for their next class. Overall, the time of day pupils had PA at was an important feature of the environment for pupils. In general, participants reported that having PA last thing during the school day was preferable.

Quantity of PE

This theme referred to the quantity of PA opportunities per week participants felt were appropriate. As well as reporting that an hour was not long enough for a single lesson, the majority of participants indicated that one period of PE a week was not adequate, as discussed by Donna and Alice:

Researcher: Yeah, and you only get one period of PE a week, do you think that's enough?

Donna: No

Alice: No I think you should maybe get a bit more, cos I don't really do any sports outside of school so PE is like the only sport I do, but erm, but if I was doing it more often it might encourage me to go out and start a club or something...

For Donna, whose only form of PA is during PE, she felt that she should receive more than one period per week. However, other participants, such as Isla, felt that it should not be compulsory to take part in PE for more than one period a week: "If people like PE they should be allowed to take PE more than...like not actually take PE, but they can say if they'd like to take core PE twice a week maybe...if someone likes it, kind of thing..." However, Isla felt there should be an option to be active more than one period a week if pupils so desire. Some of the participants had a high activity level and took PE as a standard grade subjects, these participants felt that one period of core PE a week was enough as they were active at other times.

Hierarchical structure of second order theme: Suitability of changing facilities

Figure 5.4 illustrates that seven first order themes merged to form the second order theme; 'suitability of changing facilities'. This theme refers to the importance participants laid on suitable changing facilities for PA and includes sub-themes such as privacy and cleanliness.

Changing rooms not OK

This theme referred to general comments from participants that the changing facilities in their school were not satisfactory. It was apparent that participants did not like poor changing facilities, as was illustrated by Kathryn, Kirsten and Debbie:

Researcher: And did that make a difference to whether you wanted to get changed and stuff?

Kathryn: They made you want to get changed quicker because they were horrible

Kirsten: Let's get outside...

Debbie: It's like hurry up and get changed quicker so that I can go out...

In this instance, it could be suggested participants spent more time being physically active as they were quicker to get changed than if they had better changing facilities. However, poor changing facilities were not pleasant for the participants and were viewed as a negative aspect of the physical environment.

Changing rooms are OK

This theme referred to general comments from participants that the changing facilities in their school were acceptable. Rachel felt that the changing rooms in her school were satisfactory and stated: "Our changing rooms are all right, they're fine". In this instance, the changing facilities did not appear to have an impact on this participant's PA levels. General feedback from participants was that the changing rooms in the schools in the current study were reasonable, but could be improved.

Suitable toilets

This theme made reference to the toilet facilities available in each school's PE department. In general, the participants in both schools felt that the toilet facilities in the PE department were sub-standard. Andrea and Gemma pointed this out:

Andrea: Well there's never really any soap, there's paper towels, but no soap, and some of the locks are broken on the toilets and the toilets always stink...

Researcher: Do you think it would make a difference if you had really nice changing rooms or toilets?

Gemma: Yeah, I think you'd feel a lot cleaner before and after PE, so I think it would help.

Gemma and Andrea felt it would be helpful to have suitable toilet facilities. Other participants felt that whilst it was unfortunate and slightly frustrating that the toilets did not have any locks, they did not think it had an impact on PE participation. Something reported by Anne:

Researcher: And do you think that's something that's annoying...or something that can put some people off going to PE?

Anne: Just annoying.

Overall, it was difficult to ascertain the impact that suitable changing facilities had on the overall PA environment and in turn, actual PA levels. It is possible this is dependent on individual preferences.

Privacy

This theme incorporated comments related to the privacy of the changing facilities. It was suggested by Marianne, Kirsty, Jude, and Christine that changing facilities that are not private had an impact on whether pupils felt comfortable or not:

Marianne: Not very private.

Kirsty: They're really like open and...

Jude: You don't really feel comfortable, yeah.

Christine: The showers all have their own doors, but you're actually having to get changed in front of everyone which could sometimes make you feel uncomfortable depending on who it is.

The girls indicated that the lack of private facilities could potentially make participants feel uncomfortable in front of their peers. It was also suggested that lack of privacy in

changing facilities increased the time taken to get changed, and in turn, reduced the amount of time spent in PE. Overall, a lack of privacy in changing rooms was viewed negatively by participants.

Suitable size

This theme related to the size of changing facilities. Some girls, such as Nicole and Caroline, felt that having changing facilities that were not a suitable size could result in an invasion of their personal space:

Nicole: Yeah, because there's water in our changing room at the moment and everyone is budged up one end...

Caroline: And I was like "get out of my space".

Caroline did not provide clarification as to how this impacted on her PA, however, it was apparent that this was a negative experience for her. Overall, cramped changing facilities were viewed negatively by participants.

Cleanliness

The theme 'cleanliness' referred to the standard of hygiene of changing facilities. Katy reported that it would be preferable to have toilets that were cleaner:

I think like, well if they were nice, it makes you want to sort of use them, but I don't think you could abuse the whole if they were nice sort of thing, but I think it just like makes it better cos every time you go in there it like really smells and it's horrible...

Despite a preference for clean bathrooms, Katy did not say that clean changing rooms were essential and, in fact, she suggested that having really nice changing facilities could leave them open to abuse. Another participant, Anna, suggested that having more hygienic changing facilities could help improve her confidence:

Cleaner toilet to improve confidence... because like you know the toilets in our bit, the locks are broken and it's really smelly and it's smells horrible and you

don't want to go in there and don't want to do PE, you feel all horrible and not that confident...

Whilst it was not explicitly clear how Anna's confidence levels could be increased through improving the cleanliness of the toilets, she believed that toilets that are not clean result in her not wishing to take part in PE. Overall, clean toilets were viewed positively.

Safe storage

This theme related to the availability of safe storage facilities for participant's PE kit. In one school, the participants had access to lockers in which they could store their PE kit. These were viewed very positively by all participants in this school. The participants felt that it is helpful to have a locker in which they could store their PE kit throughout the school day instead of carrying it with them or leaving it not secured. These participants paid a fee for having a locker and they were happy with the price they are charged for the facility.

Additional first order themes

Figure 5.4 illustrates that the following three first order themes did not emerge into any second or third order themes but related directly to the overall theme of physical environment.

Suitable clothing

This theme referred to the suitability of clothing worn to be physically active. Participants had differing views regarding the influence of appropriate PE kit on PA participation. This was illustrated through discussion with Michelle, Becca and Carron:

Michelle: Well because people are judging what you're wearing.

Researcher: And how can that make you feel?

Michelle: It just makes you feel like you're not good enough, if you've not got your hair done right, that you've not got the right clothes on and the best trainers and that you're not good enough.

Becca: I don't think it makes a difference, for me it doesn't anyway.

Carron: No, I don't think it would solve it completely. Cos, you might get something that suits some people's shape, but make others....but maybe not necessarily a colour code or nothing too out there, just like plain things.

Discussion demonstrated that for some girls, what they wear for PE can have an impact on whether they feel comfortable in the class or not. Another participant, Kate, explained why she felt clothing was important in a PA environment: "Cos you actually get it in your head that they are actually better than you cos they're wearing better clothes". In this instance, it was suggested that what is worn to be active, can have a negative influence on an individual's confidence in their ability. For others, what they wear to PE does not influence their PA levels or their feelings towards PA.

There was no obvious solution regarding suitable attire for PA. Some participants believed that there should be some form of uniform, however, others such as Anne anticipated problems with this:

I don't know because you know when you've got uniform and stuff, like maybe some people don't like joggies and that, it's still a good idea, but I think some people would be like "I don't want to wear that" and get all moany and won't even do PE.

In sum, it appeared that the participants suggested that not having a PE uniform could lower the confidence of some individuals, but introducing a uniform could reduce participation for others.

Suitable weather conditions

Participants highlighted that weather conditions could have an impact on their PA levels. It was reported that if there were adverse weather conditions then some pupils, like Gemma, did not want to go outside to be active: "Yeah sometimes if it's raining you can't be bothered." For others, such as Lucy, she did not feel that the weather was important: "No the weather doesn't really bother me, but if it is quite bad weather you do kind of

expect to be made to do everything inside.” Lucy indicated that she did not mind if the weather was bad and that the activity was usually moved to indoor facilities if the conditions are poor. Anna felt that moving activity indoors was appreciated in poor weather, but felt that outdoor activities could, at times, not be replicated indoors:

Or like if you have to stay in cos it’s too cold, like if you’re going outside to do rounders but if it’s too cold so you come in and the other halls are taken so we have a small hall so you can’t really play.

Anna highlighted that she did not mind where the activity took place, but sometimes indoor activities were not conducive to all activities. This links to the earlier theme ‘appropriate facilities’ which was highlighted as an important factor of the physical environment.

General physical environment comments

This theme referred to comments made when comparing the impact, or importance, of the physical environment versus the social environment. When asked whether they felt there were more social environmental factors or physical environmental factors that impacted on their PA levels, the majority of participants felt that there were more social environmental factors. In saying this, it was highlighted that if the social environment was optimal, but the physical environment was not, then this would not be conducive to PA. As explained by Emma: “If you’ve got a good teacher, but no equipment it’s useless anyway.” Further, some participants felt a balance between ideal physical and social environmental factors was necessary for PA participation, as explained by Rachel: “Kind of a mix as well though, cos the physical can still like contribute to how you feel and stuff...” Overall, whilst the social environment was initially highlighted as potentially having a greater impact on how an individual might feel, it is clear that consideration of the impact of the physical environment is essential.

5.8.2 Main Theme: Social environment

The main theme, ‘social environment’ was broken down in to three sub-themes: Class composition, class climate and characteristics of and behaviours of exercise leaders and is presented in Figure 5.5. Results are presented in diagrammatic format according to the themes identified, and each sub-theme is presented separately.

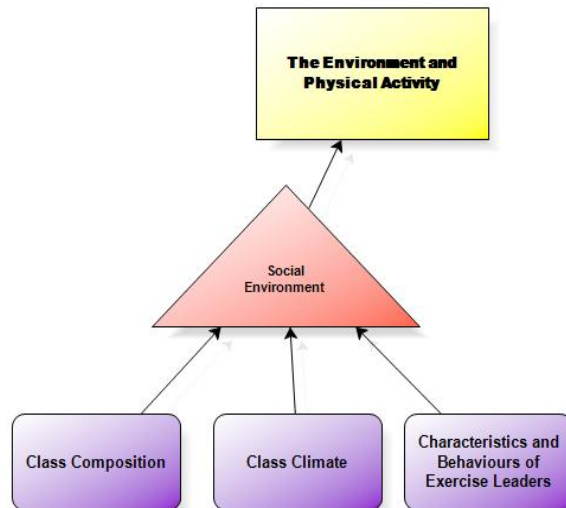


Figure 5.5: Sub- themes of the social environment; class composition, class climate and characteristics and behaviours of exercise leaders.

Sub-theme: Class composition

Class composition referred to the tangible components and the organisation of the people in the PA class. Whilst similar to the physical environment, this theme is concerned with the organisation and make-up of the participants, rather than material objects and activities. Figure 5.6 illustrates that there were 16 first order themes and six emergent second order themes. There were no third order themes and one first order theme did not develop into a second order theme, but emerged directly into the overall sub-theme.

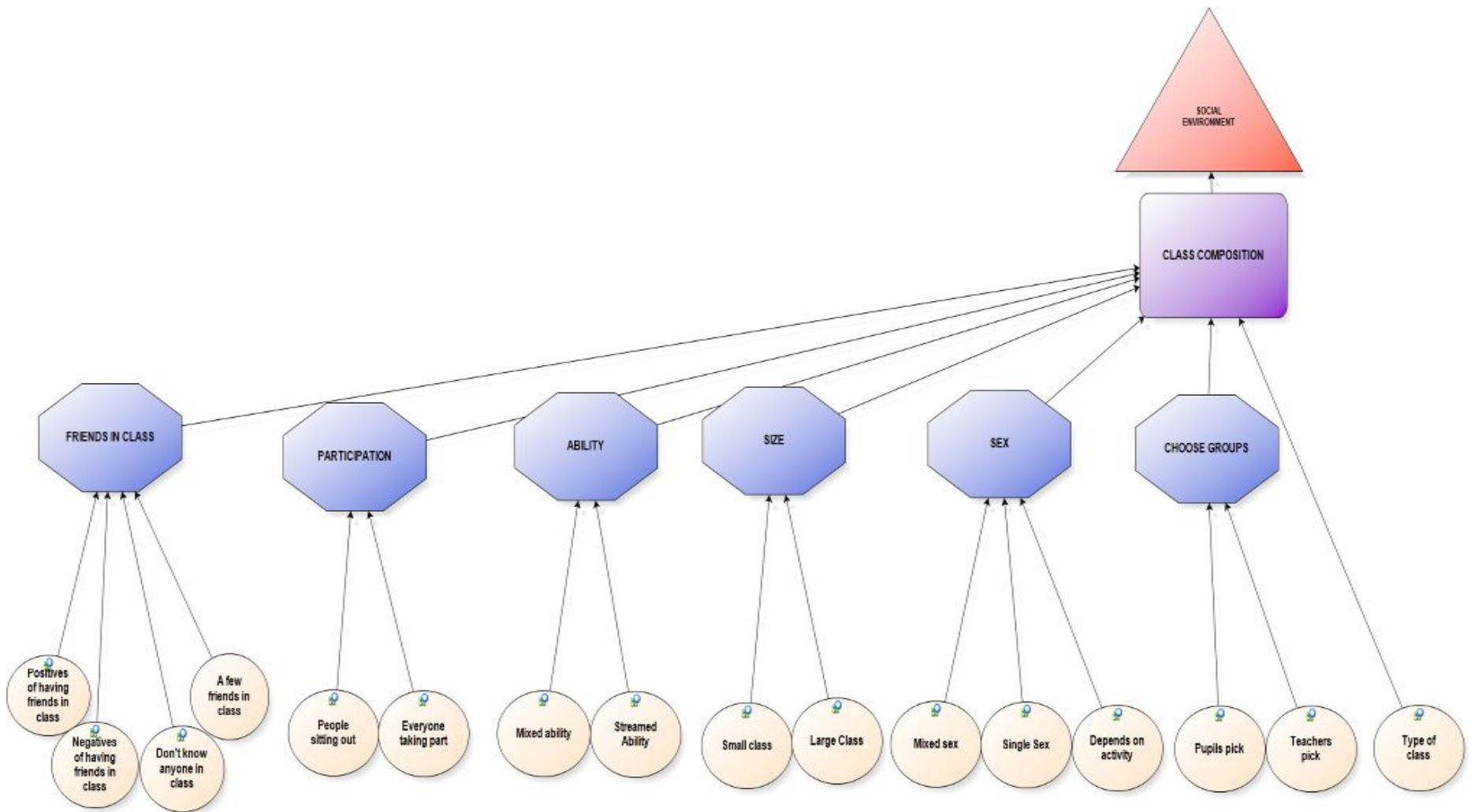


Figure 5.6: Sub-Theme: Class composition

Hierarchical structure of second order theme: Friends in class

This theme was defined as a class in which individuals are with their friends. It was developed in relation to meaning units which contained information about having friends in a PA lesson. Figure 5.6 illustrates that there were four first order themes that develop into the second order theme ‘friends in class’.

Positives of having friends in class

This theme was defined as a class in which participants felt it was beneficial to have friends present. It was developed from meaning units which highlighted the benefits of friends being present in the same PA class. Lucy explained why it was important for her to have her friends in her PA class:

With your friends you have a laugh at PE, imagine sitting in a group with a person you don’t know you take it all serious, you don’t speak, but when it’s like with your friends you can laugh and be like I’m running round the field or something and you’ll all just laugh, in like a joking way, but when you’re with people who are serious everyone just stay quiet and you’re running and you’re like oh my god they’re staring at me it’s so embarrassing.

In this instance, Lucy felt that she could have more fun when her friends were in her class. Lucy felt that the class was more serious, and that there was less communication during the class, when she was not with her friends. Lucy also felt that when she was not with her friends, she was more aware of people staring at her and this made her feel uncomfortable. Similarly, Alice reported: “If you’ve not got your friends to join in with you, you feel a bit like....I don’t know...just, I don’t enjoy it if I don’t have people I know and my friends and people I get on with.” Alice explained that she did not enjoy PE when her friends were not there, but found it hard to provide an explanation for this.

Rachel explained the difference between classes now and in first and second year of school:

When we were younger, when we were in first and second year and we were put in our classes and we didn’t pick like now when we pick our subjects you like make sure you pick you are in classes with people you’re comfortable with people

with, usually, but when it was first and second year it was quite awkward and you didn't want to do PE with like girls you say didn't get on with...

Rachel reported that she preferred being able to pick her subjects and class mates as it made her feel more comfortable. Rachel indicated that when she was in first and second year she would feel uneasy being active with girls she did not know. Overall, having friends in a PA class was strongly supported by participants.

Negatives of having friends in class

This theme was defined as; the negative aspects of having friends in a PA class. The theme emerged from meaning units that mentioned the negative elements of having friends in one's PE class. Katie felt that it was sometimes unhelpful to have her friends in her PE class:

Cos like your friends could like, you like it and your friends could be like oh I don't want to do it and that and they would just huff about and that when you're trying to do it and then if you're partners for them and they wouldn't take part properly and you're like what's the point in you even doing it if you're not even going to try and that...

For Katie, if her friends were less enthusiastic about an activity than her, then sometimes this impacted on their effort, and thus spoiled the experience for both of them. Similarly, Ellen identified that sometimes her friends were not of the same ability level as her:

It's like well I want to do this and you try and get a different partner, but they want to stay with you, cos you're their friend, but you want to try harder so you want to get a partner who matches you better for that activity.

Ellen reported that she was not able to exert as much effort with a friend of a lower ability level. Further, she felt that it was difficult to stop partnering this person as they are her friend. It was identified that having friends in ones PA class who put in less effort or were less capable was not favourable.

Don't know anyone in class

This theme was defined as being in a PA class in which participants do not know anyone or are not friends with anyone else taking part. Julie did not enjoy her time in PE when she did not know anyone: “you could be with like someone you don’t even know or someone you don’t really get on with or even like that much and it just makes your time in PE rubbish.” Whilst she did not elaborate on this, Julie was clear that it spoiled her time in PE. Anna explained her reasons for not wanting to be in a class where she did not know anyone: “When you’re with other people that you don’t actually know you can’t really... burst out and have fun.” Anna felt that she had to be more reserved in a class where she did not know anyone and it was difficult to have fun in this situation. This was a view that was shared by Louise:

Cos when you’re with your friends you can be yourself and they know you and if you say something totally crazy your friends know that’s just you, but if you say something crazy to a stranger then they are just like aren’t you a bit weird...and they don’t want to talk to you...

Louise explained that she felt she could not be herself in a class where she did not know anyone and if she was, then she might not be accepted by other members of the class. This lack of acceptance was also mentioned by Lucy: “I was left out because I didn’t know anyone in that class, and everyone like was dunno, just like talking and that and I was just like standing at the back.” Lucy was not included by others in her class and therefore felt that she did not want to be involved in the PA class. This feeling of being ‘left out’ when they did not know anyone in their class was shared by other participants. Overall, not knowing anyone in ones PA class was perceived as a negative component of a PA class.

A few friends in class

This theme was defined as a PA class that contains a few friends, rather than a class that comprises of only friends. Claire enjoyed a class that had a mixture of friends and non-friends: “I’d like small classes, but they’ve to have your friends and other people who aren’t your friends, cos you can make friends, but you’ve still got...” For Claire, having a mixture of people she did and did not know provided her with an opportunity for social interaction and to make new friends. This links with the theme ‘opportunity for social

interaction' discussed in the sub-theme class climate. Lisa described the composition of a PA class that she is currently in:

...you normally do still get 1 or 2 friends in your class, and then your other friends they have friends as well so our teachers always kind of put us in with like one of our friends or something, so you're not kind of with complete strangers.

Lisa was content with this make up of class, and felt that as long as she had a few friends in her class then she did not mind having people she did not know there too. This view was echoed by other participants and the general opinion was that as long as the participants had a few friends in their class, they were satisfied with the class organisation.

Hierarchical structure of second order theme: Participation levels

Figure 5.6 illustrates the emergence of the theme from two first order themes. It is defined as, a theme which describes the participation levels of the PA class.

People sitting out

This theme was defined as a class where pupils sit out and do not participate in PA. It emerged from participants references to people in their class not taking part. Susie, Sandra and Kate described the impact of people sitting out:

Susie: Quite angry, because...

Sandra: It's affecting us.

Kate: You make the effort to help the people in your group and other people just lay back and are like oh it's just PE who cares type thing...

The girls displayed a variety of responses when others did not join in; Susie felt annoyed when people did not join in and Sandra felt that it impacted on her, but did not elaborate further on this. Kate described how she helped others in her class, but others had the attitude that because it was PE, they did not need to put in any effort.

A similar conversation between Lesley and Carole also described the effects of people sitting out during class:

Carole: It would be embarrassing doing it in front of other people

Lesley: Just when other people are sitting out, like just because they haven't brought their kit, like and they're sitting laughing at you and you're actually bothering to do something

Carole: Yeah, they're like watching and stuff and it just makes you feel so paranoid about what you're doing, so you don't put 100% into it because you know there are other people watching you whereas if they were doing it they would be doing other stuff as well so like you wouldn't feel like they were watching you if you get what I mean cos they'd be preoccupied and stuff.

The girls indicated that they felt embarrassed and uncomfortable when people were sitting out and watching them. Carole went on to explain that this had an impact on the effort she put into an activity as she felt self conscious.

Lindsay felt that when people sat out it could have a negative impact on the class: "When everyone gets into it, I think that's quite important, cos if it's just something no one is interested in then it can get quite boring and only some people join in and other people are just sitting back." This quote illustrates that, for Lindsay, people not joining in made the class boring for her. In general, people sitting out and watching others made participants feel uncomfortable and was deemed unfavourable.

Everyone taking part

This was defined as a class in which everyone is participating; nobody is sitting out. It emerged from meaning units referring to whole class participation. Lucy explained why it was important to her that everyone in the class was taking part:

Cos you can all like contribute to what you're doing and help each other out like if say it's a team game and everyone's taking part you can all help out and do stuff together, but like you don't really want anyone left out in the class, so you try and all...take part and be together...

Lucy explained that it was important for her that the composition of the class contained people who helped and supported each other and as a result of this composition, a sense of togetherness in the class was created. Anna talked about the effects of participation levels in her class: "...when everyone gets into it, I think that's quite important, cos if it's just something no one is interested in then it can get quite boring and only some people join in and other people are just sitting back." Anna felt that participation and everyone 'getting into it' was a key factor in the PA class. Moreover, Anna felt that a lack of participation could result in a tiresome and uninteresting class. Overall, 'everyone taking part', was viewed as a positive feature of a PA class.

Hierarchical structure of second order theme: Ability levels

This theme was defined as the capabilities or skill levels of pupils taking part in a PA class. The theme developed from two first order themes as illustrated in figure 5.6.

Mixed ability

Mixed ability referred to a class that contained pupils of all ability levels, both higher and lower. Tina enjoyed a mixed ability class: "...don't know, cos like we have our core PE class we've got people lower than us and people higher and there are boys in it as well... and it just makes it more fun." Louise felt that it was useful to have a mixed ability class: "Teaches other people if they're not as good, you can just show them, well not show them, but they like learn stuff from people who are maybe just a bit better than them and everyone ends up evening out." Louise felt that for those who were less able, a mixed ability class provided an opportunity to learn from those more capable, and as a result, she felt that the class ended up with a good mixture of participants who could work well together.

Whilst some participants enjoyed mixed ability classes, other participants did not have such a positive opinion of them, as mentioned by Sarah: "I always feel out of place in my PE classes, because quite a lot of the time they're...well they used to be quite 'sporty' people in them..." Sarah did not feel comfortable in a class where there were a lot of 'sporty' people. Similarly, Jade felt out of place and self conscious in a class with high active pupils who were sporty and very thin: "Yeah, if you're uncomfortable with your class, like, obviously if you're put in a class full of stick thin, 'sporty' people it can be a bit awkward." Finally, Emma did not enjoy a mixed ability class as she felt that it

provided an opportunity for her to be highlighted as having a lower ability level: “Yeah, kind of, if they’re like singling you out and they’re like you’re really crap at this sport you get put in a little different group.”

Views on a mixed ability PA class were varied. Some participants felt that it made the class more fun and increased opportunities for learning and interaction, whereas other participants felt uncomfortable in such a class.

Streamed ability

Streamed ability referred to classes that were focused around one ability level as compared to mixed ability classes. When asked about the composition of classes in relation to ability, some participants, such as Lindy explained that the nature of being able to choose class topics meant that classes were automatically streamed: “It kind of goes like that way anyway cos you go with the people, cos there are so many like different topics to choose, you kind of go with the people with the same ability as you anyway.” For Lindy, she was likely to choose her activity based on the ability of those also taking part in that subject. In a similar way, Julie talked about ability levels in relation to choosing subjects:

Sometimes when we’re choosing at the start of the year and you choose maybe like rounders and you’re like I really want to do rounders and then you go to rounders and you see all the people there and you’re like oh no they’re all really ‘sporty’ and really competitive and they’ll not make it fun for you, so you don’t really get to choose what you want to do, cos I wouldn’t want to do it with they people.

Julie avoided certain subjects where she would be in a mixed ability class and with people of a higher ability level than her, and would rather participate with people who had the same capabilities as her. Similarly, Claire preferred a streamed ability class to a mixed ability class: “...oh, they can do that better than me, I should be in a lower group. You’re all kind of equal to each other.” Claire preferred a feeling of equality in the class; something that came from a streamed class. Rachel also favoured a streamed class: “I don’t really like mixed ability, cos if there are people who are better than you say oh you’re rubbish and people are worse than you they don’t put the effort in...that’s not much fun.” Rachel mentioned that having people who were of a higher ability level than her could make her feel inadequate as well as promoting negative communication in the class. However, Rachel also noted that when she was with people of a lower ability level,

then they were less inclined to contribute to the class and this impacted on her enjoyment. In general, there was support for streamed classes, but they did not outweigh the comments made in relation to mixed ability classes.

Hierarchical structure of second order theme: Size (number of pupils in class)

The theme 'Size' was defined as the number of people present in a PA class. Figure 5.6 illustrates that the theme emerged from two first order themes.

Small class

This theme emerged from pupil's comments relating to a class size being small, which was generally defined as smaller than 20 pupils. Beth preferred a small class:

But, if you have a smaller class as well the teacher can do more one to one with everybody, cos if there's more people it's going to be harder for them to go round everybody whereas if it's a smaller class they can give you pointers of when you're going wrong and where to improve it and stuff.

Beth noted that there was greater opportunity for the teacher to spend time on an individual basis when class sizes were smaller. In turn, Beth felt that the teachers would be able to assist pupils more and offer them advice on how to enhance their performance. When asked to describe the ideal number of people in a PA class Ruth described the following:

Cos 30 is too big a number and there is going to be people left out and 20 is a rough number and teams can be fair and a teacher can cope cos 30's quite a big number for a teacher to take on a class.

For Ruth, 20 pupils in a class was the optimum number, especially to ensure ideal levels of supervision.

Large class

This theme referred to participants comments in relation to a large or larger class; in general this was defined as over 20 pupils. Lucy talked about larger class sizes:

...and so like sometimes the sizes are actually quite good if they're big cos you get to play with different people instead of the same people over and over again but then some classes you would like to be small and that would just depend on the activity you were doing.

Lucy enjoyed having a larger class as it enabled her to enjoy more social interaction, something that was discussed under the theme of class climate. However, Lucy acknowledged that a smaller class was sometimes more appropriate for other activities. Similarly, Jude discussed the conflicting issues surrounding class sizes:

Like in rounders it's better to have bigger teams cos there's more people to run around and be on the bases and everything but when there's a smaller class people have to go on the bases and there is less people to field round about....I don't know...

Jude felt that for rounders, larger classes were more suitable, however her last sentence explained that she was not fully committed to promoting a larger classes for all activities. Sally commented on class size in relation to teachers: "Yeah, if it's quite a big class they should maybe have more than one PE teacher taking part." This comment was made in relation to adequate supervision in classes that had more members. Pupils felt that sometimes larger classes were more appropriate, but they could only be productive if there were enough teachers present.

Sophie indicated that having a class that was large could negatively influence her comfort levels in a class, something that is discussed in more detail under the theme 'Class Climate':

Sophie: Sometimes they put classes together if like a teacher is off and they're massive and full of people you don't know.

Researcher: And how does that make you feel, like you want to do it or...?

Sophie: It makes you feel really self conscious cos you're not comfortable, you don't know the people...you're just like...

Similar to Sophie, Hayley felt that having a smaller class made her feel more comfortable as there were fewer people to look at her: “Cos there’s less people to watch you....say you’re doing something that people have to watch you there’s less to watch you.”

There was an array of views in relation to class size. Neither larger nor smaller classes were the dominant favourite. However, it was notable that a preference often dependent on the format of the activity that was being carried out and relevant levels of instruction and supervision.

Hierarchical structure of second order theme: Sex composition

This theme was defined as; ‘the gender of the individuals taking part in the PA class’. Figure 5.6 illustrates the emergence of this theme through three first order themes.

Mixed sex

This theme was defined as a class with both boys and girls. Alice enjoyed a mixed gender class:

I prefer it with the boys, cos like, sometimes there’s girls in your class who really don’t try and at least the boys like, most of the time are trying so it gives you like, especially if you like enjoy doing it, makes it more fun and more competitive for you and like gives you something to try and work on.

Alice felt that a mixed sex class added to the enjoyment of the class. She felt that the boys put more effort into the class and, in turn, this made the class more competitive, something she enjoyed. Alice also alluded to a mix sex class providing her with more impetus for improvement. This was a similar view to Emma: “Well you learn quite a lot from the boys, because they’re like more, I don’t know I can’t explain it, you learn quite a lot from the boys... like their strategies and stuff and what they do.” Emma felt that there was an opportunity for her to learn when there were boys in her class, something she felt was a positive factor.

Single sex

This theme was defined as a class which is either girls only or boys only. Lisa felt strongly that a swimming class should be girls only: “... it’s much better with just girls, you can’t have pure boys in the swimming pool at the same time.” For Lisa, it was not

appropriate to have boys in a swimming class. Catherine agreed with her, and explained her reasoning for this in more detail: “Cos girls are more body aware...they don’t, they’ll like be self conscious, they’ll constantly be looking at themselves in case like boys are like pure talking to their friends like “look at her” like in a nasty way though.” Catherine felt that girls are more self conscious than boys and, in turn, they would be concerned that they and their appearance would be discussed negatively by boys in the class.

Similarly, Louise did not enjoy having boys in PE:

Boys are really like evil...they don’t like give you the ball and stuff and girls are more like friendly with you, they’re more like...they help you along in PE and boys are more like you’re rubbish and stuff like that.....and just like horrible.

Louise felt that girls were more likely to be friendly towards her and helpful during PE. Conversely, she felt that boys were less likely to interact and were more likely to communicate negatively with her. Gemma also disliked PE classes with boys:

Yeah, like cos we do PE and it’s quite hard when you’re playing a game and it’s like boys...they’re so masculine and it’s so competitive and like they don’t give you the ball so much cos you’re a girl and they think that you’re going to get it and cost them the game basically...so they’ll be like just pass to the guys and you’ll just like feel left out and even though you’re running quite fast and trying really hard it’s still...

Gemma felt that boys highlighted their masculinity which led on to increased competitiveness. For Gemma, the boys were less likely to interact with the girls and, as a result, she felt left out and inadequate.

Sex composition depends on activity

This theme was defined as a preference for single or mixed sex class dependent on the PA taking place. When asked their preference for class composition in terms of sex, several participants felt that it could depend on what activity was being carried out, as illustrated by Jo: “I think it depends on what activity you’re doing.” This opinion was shared by several participants including Ruth who explained what activities she would and would not be happy to participate with boys in: “I think if it’s hockey or football or something

like basketball I'd be ok playing with the boys, but if it was dancing or something I'd rather do it with just girls..." It can be seen that Ruth does not mind traditional team sports with boys, but for a more non traditional activity such as dancing she would prefer it to be girls only. There was a lot of support for swimming to be a girls only subject and participants such as Lindsay felt that "swimming, dancing, gymnastics, that sort of thing" were activities in which it was best to have girls only. In general, it was the view of several participants that the sex of the class was dependent on the activity being carried out.

Hierarchical structure of second order theme: Choose groups

This theme was defined as the selection of pupils into teams or groups in a class. It can be seen from figure 5.6 that it emerged from two first order themes.

Pupils pick

This theme was defined as pupils being allowed to pick the groups within their class. Jessica felt that it would be beneficial for pupils to pick their own team:

Cos when we're in PE we have to go with people that aren't that nice to us and stuff and they don't like pass the ball and then you aren't involved in anything, but if you picked your own teams you'd get the ball all the time...

For Jessica, groups that were picked by the teacher meant that she was excluded from participating in some activities. Jessica believed that she would be more involved if she could pick her own team. Conversely, Anna did not think it was appropriate for pupils to pick their own teams:

Well like the people, normally when you're in a class when you're doing teams, people will normally choose their friends first, I know I do it sometimes, but sometimes, I've been in a class before when none of my friends were in my class and it's quite unfair when let everyone's chose their friends and you're kind of just waiting with a few other people, like and you just kind of...

It can be seen that Anna felt that when pupils are allowed to pick their own groups, then they tended to pick their friends first resulting in some people being isolated; something that Anna felt was unfair. In general, there were varying views on the pros and cons of pupils picking their own teams in their PA class.

Teachers pick

This theme referred to teachers picking the groups within a PA class. As with the previous theme, there were positives and negatives associated with teachers picking groups in PE. Ashley agreed with Anna, and felt that it was more appropriate for the teachers to pick groups:

It was like every time, like once a week we had this teacher but then we said we really didn't like it cos we always got picked last, so they sort of changed how they did it and they like picked the teams.

Ashley highlighted the problem of exclusion if people select their friends first when choosing teams and groups. Ashley preferred it when the teacher was tasked with group selection. However, Susie felt that sometimes the teachers did not select suitable groups: "and you're not like comfortable being with the people who are in your group." Susie highlighted that the teacher may have appointed her to a group that she was not comfortable in and this was not viewed positively.

Additional first order theme

Figure 5.6 illustrates the additional third order theme that did not emerge into second or third order themes, but related directly to the sub-theme class composition.

Type of class

This theme referred to the type of class a participant is a member of, specifically whether it is a core PE class or Standard Grade Class. Some of the participants took PE as a standard grade subject and thus differences between core PE and standard grade PE were highlighted. Kate highlighted a difference: "I feel like that in SG PE we all seem to get on really, really well like we..." It can be seen that Kate felt that the pupils tended to get on very well in the Standard Grade class, there were no comments of a similar nature pertaining to the core PE class. Similarly, Catherine felt that there was a special relationship between members of her standard grade class: "We're all really close." For Catherine, she acknowledged a bond between those who took standard grade PE. Overall, the type of class appeared to impact on some participants perceptions of the relationship and closeness of the class members.

5.8.3 Sub-theme: Class climate

Figure 5.7 illustrates the sub-theme ‘class climate’. The theme was defined as the intangible aspects of the social environment of the PA class. It emerged from comments relating to pupils perceptions of the atmosphere or, the general mood of the class. Figure 5.7 shows that there were 17 first order themes that developed into four second order themes, one of which evolved into a third order theme. These themes then emerged into the sub-theme; class climate. As with previous themes, the diagram is hierarchical and there were occasions where first order themes were directly related to the overall sub-theme.

As a way of improving the logic and consistency of the data, emerging second order themes were all labeled as positive aspects of a class climate. Any negative features of the class climate were reversed so that the label referred to not having that facet. It is hoped that this will provide an overview of the optimal aspects of the class climate for a PA class. This was not feasible for the themes ‘physical environment’ and ‘class composition’.

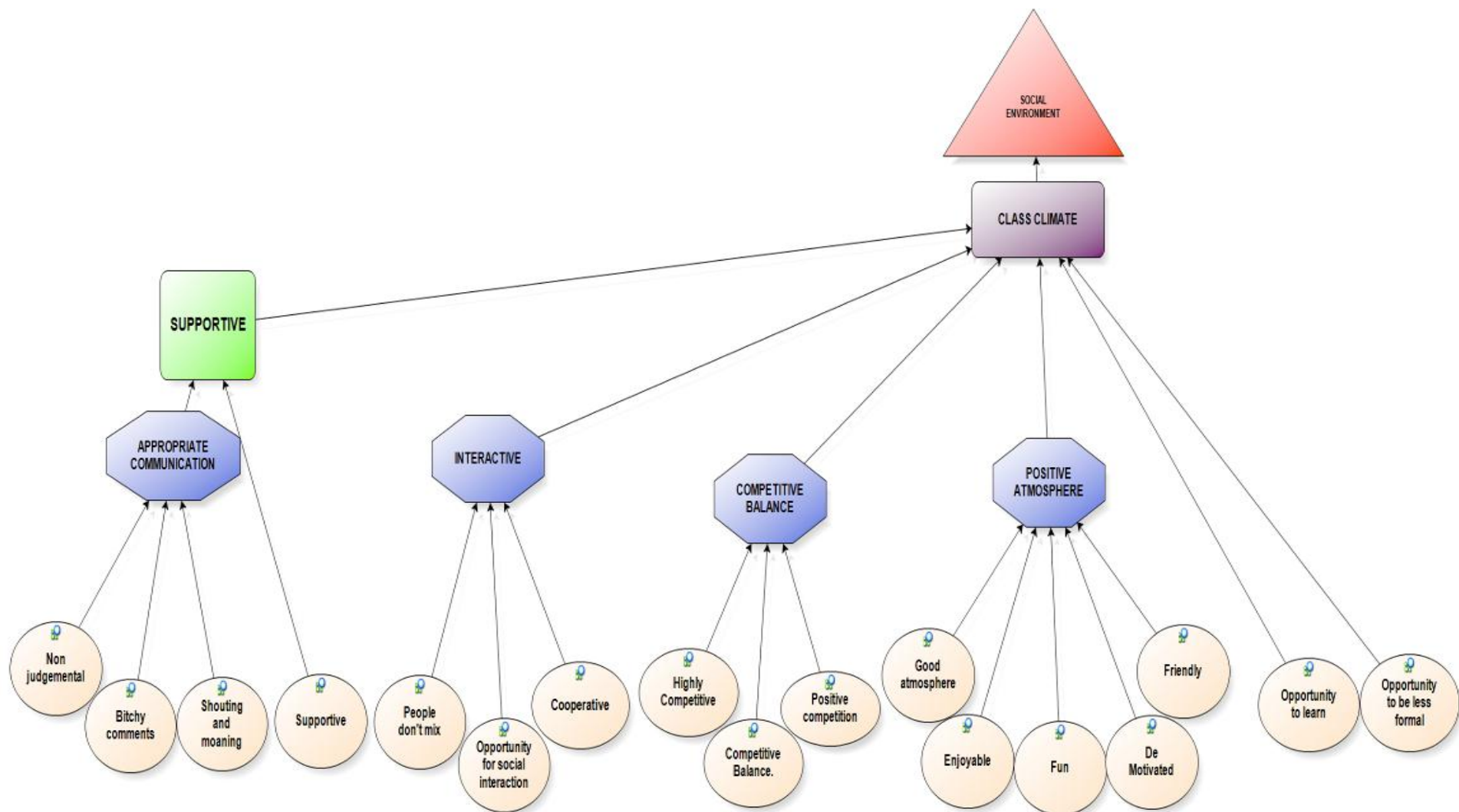


Figure 5.7: Sub-theme: Class climate

Hierarchical structure of third order theme: Supportive

This theme was defined as an environment that is encouraging and promotes compassion and understanding between pupils. Figure 5.7 illustrates one second order theme that was developed through three first order themes. One first order theme, 'Supportive', did not develop into a second order theme and linked directly to the third order theme. All first order themes included meaning units that described and discussed factors which both promoted and discouraged the development of a supportive climate.

Appropriate communication

This theme was defined as; appropriate communication between class members. Figure 5.7 illustrates that it emerged from meaning units that referred to both positive and negative communication.

Non judgmental

Non judgmental referred to meaning units that demonstrated an environment that avoided judgmental feedback and comments amongst participants. Alice described non judgmental feedback: "Like if you do something wrong, nobody is going to say "oh why did you do that" if you get what I mean, they won't care you're just having a laugh and having fun...." She felt that it was important people were not criticised for any mistakes they made and that people were not made to feel inadequate in the class. A class that was non judgmental was viewed as positively contributing to an effective PA class climate.

'Bitchy' comments

This theme was defined as malicious and spiteful comments that had been made during PE class. They emerged from participants' references to these remarks. Susie felt that PA changing rooms provided an opportunity for harassment: "I think that changing rooms like are probably the bitchiest bits of...like everyone bitches when they're in the changing rooms." Other participants agreed with Sophie and participants commented that people would pass remarks on others in the changing rooms.

Dance was highlighted as an activity that cultivated the emergence of malicious comments between girls. This was described by Donna and Emma:

Donna: Just don't go to the dance studio and you're alright....cos they're all body obsessed in there.

Researcher: Oh really, in what sense...

Donna: In the sense that if you're dancing, they'll, like the girls that do will probably make a comment probably, they're more body obsessed than like people that just kind of go to PE and have fun kind of thing

Emma: If you're not good at dancing they'll all slag you off.

Dancing tended to provide a platform for bitchy comments and participants felt more exposed in this activity to being harassed than in other classes. This was echoed by Kate:

And it's like for dancing, we're like at the age where we're really like not as confident if you get what I mean, cos we're like grown up, and we're not like....cos like in high school girls are really quite bitchy so like you feel like if you go to dancing or something people are going to make comments about you so just like totally makes you not want to do it cos you're scared in case like what they're going to think of you and stuff...

Other participants felt that PE as a whole could provide individuals with an opportunity for teasing and bullying, an experience described by Jessica:

Well, yeah, because there's this whole popularity issue and like whether you're really popular or like not as good as everyone else, there always seems to be someone who's going to put you down for what you're doing in PE.

As well as highlighting the opportunity for people to make cutting remarks in PE, it was suggested that PE also provided the opportunity for 'popular' groups to emerge and dominate, as described by Lucy: "It just makes you feel like you're not good enough, if you've not got your hair done right for me, that you've not got the right clothes on and the best trainers and that you're not good enough." Lucy illustrated the feelings of inadequacy that emerged from her experience in PE, as did Eleanor:

Yeah and the other girls make comments like about your weight and the way you look or the way you dress and stuff and that's sort of...well some people think

well whatever I don't care what you think, but others like might take major offence to it and think "maybe I should be more like them and stuff".

Eleanor acknowledged that PE provides multiple opportunities for pupils to pass comment on other pupils. She appreciates that the consequences of these comments can have differing effects on different individuals. Dominance by more 'popular' groups and their tendency to pass negative remarks on fellow classmates was viewed as a negative component of the class climate. Ruth described a PE lesson in which she was subject to demeaning comments:

There was one time in third year when I got put in a group with two girls who really didn't like me and I didn't like them and like half way through they started slagging me as I wasn't doing as well as them so I actually had to go and ask the teacher if I could sit out as I was that uncomfortable with it.

In this instance, Ruth withdrew from taking part in PA because the climate created by these negative comments was too uncomfortable for her. Overall, bitchy comments were viewed negatively by participants and ultimately they were not viewed as conducive to a supportive PA class.

Shouting and Moaning

This theme referred to negative communication in the form of shouting or moaning at pupils, usually in relation to their ability. Anna expressed her views on shouting and moaning in her PE class:

... even if you're trying your best people are still going to shout and you, you're going to like really not want to take part and just be like I'm not going to put in the effort cos they're just going to shout at me anyway, sort of thing....so like, I don't know, you don't want to do it.

Anna explained that when people shouted and moaned at her, she was less inclined to want to participate fully, if at all, in the class. This was echoed by Sophie: "You just want to kind of leave, because you don't feel appreciated that you are contributing to the game and one little mistake like dropping the ball like you completely get shouted at..." Sophie described how she wanted to leave the class if she makes a mistake due to some class

members' reactions. Additionally, because of negative comments, she did not feel like she was a valued member of the class. Shouting and moaning by the class had an impact on some participant's levels of esteem, such as Louise, who described how she felt when the class shouted at her for making a mistake: "embarrassed in a way." Shouting and moaning was viewed as a negative means of communication between class members and it did not promote a supportive class climate.

Supportive

The theme 'supportive' was defined as an environment in which pupils are encouraged and helped by their fellow classmates. It was developed from meaning units describing such behaviour. Katie expressed her views on the impact of a supportive class climate:

It's good to have people in your class who encourage you- not just the teacher....but like, your friends encourage you as well, they sort of like, when you're playing rounders they're like "run, run" and then everyone starts clapping and stuff and you get really into the game, so it's good to have people encouraging you...people supporting you.

Katie explained how this helped her to become very involved in the activity and to enjoy the experience. Rachel shared a similar view:

...there's been a few times like if you're playing a game and you score a basket and then you get a high five or that and then you become friends, you become friends because they've supported you, they helped you and pushed you and you scored the basket so they high five you and you feel proud that you got it and you just become closer...

In this instance, Rachel described how the support of her class members made her feel 'proud'. Rachel also felt that a supportive class assisted the development of friendships in the PA environment, which linked to the concept of a class climate that is conducive to interaction between members. A class that was supportive was viewed as a positive attribute of a PA class.

Hierarchical structure of second order theme: Interactive

This theme was defined as a class climate that promoted cooperation and communication between pupils. It emerged from statements relating to pupils willingness to work together and interact. Figure 5.7 illustrates that this second order theme progresses from the evolution of three first order themes.

People don't mix

This theme was defined as a lack of interaction or mixing between friendship groups in the PA environment. This theme contained meaning units relating to pupils' perceptions that pupils sometimes don't mingle in PE. Anna explained that she felt PE did not provide a platform for interacting and making new friends as much as other subjects did: "...you make new friends in other subjects, but in PE people seem to stick with their friends they dinnae seem to come over and make new friends." Lisa described how a lack of interaction in PE could have an impact on her: "Cos that happened once, we were playing basketball in little teams and nobody passes to you if they don't know them..." For Lisa, a lack of interaction meant that she wasn't able to participate fully in the PE lesson. When pupils reported a lack of interaction in PE this was viewed negatively.

Opportunity for social interaction

This was defined as chances for mixing between social groups in a PA class (the opposite of the previous theme). This theme emerged from statements indicating that PE was a good opportunity for social interaction. Sarah explained this: "I think you bond better with people, like if you didn't really know someone that well and then if you played PE with them and you had to be on the same team and you like have a laugh." Sarah felt that PE was a good opportunity for relationships to develop. This was a thought shared by Lucy: "...but sometimes you can end up making friends with people who are like chavs or like, because they are actually really nice people they just have this whole hard image..." Lucy believed that PE offered an opportunity for people to mix with those they wouldn't usually mix with, and discover different aspects of their personality. A class climate which promoted interaction between pupils was appreciated by them.

Co-operative

This theme was developed from meaning units that described a climate in which working together and supporting each other in a PA class was viewed positively. Ashley describes the co-operative climate in her PA class:

Cos you can all like contribute to what you're doing and help each other out like if say it's a team game and everyone's taking part you can all help out and do stuff together, but like you don't really want anyone left out in the class, so you try and all....take part and be together...

Ashley explained that when everyone contributed and helped each other, then this impacted positively on the class. Similarly, Jodie felt that when everyone in the class co operated and mixed then it was conducive to a positive class climate: "Like everyone in the class getting along with each other like nothing like, you know no enemies and that, and everyone's quite happy to just play." A lack of conflict between class members was helpful in creating this positive and interactive climate.

Hierarchical Structure of Second Order Theme: Competitive balance

Competitive balance was defined as; 'an atmosphere that attains an equilibrium between competition and fun in PE class. This theme developed from meaning units referencing the competitive conditions of the class. Figure 5.7 illustrates that there were three first order themes that related to both positive and negative aspects of competition and these merged into the second order theme of competitive balance.

Highly competitive

Highly competitive was defined as an environment where there is a primary or high level focus on competition and outcomes in the class. A class that had a highly competitive climate was sometimes viewed negatively by participants. Alice explained the effect a competitive climate could have on her: "If it's over competitive and if people are like shouting and screaming and arguing over points it's quite boring." Alice viewed high levels of competitiveness negatively.

Rachel explained the impact that a competitive class climate could have on her behaviour: "But like when you get really competitive and you get angry and you get really competitive and this person just can't try, you get angry and you end up saying something, you get really competitive." In this instance, Rachel reported that it can upset others when the class is very competitive and this is something that she viewed negatively. Finally, Susie felt that when the class environment was too competitively focused, people would become annoyed with each other: "So it's not like too competitive and like everyone is not getting annoyed with each other and like grrr, you just done that

and then like if you do anything wrong everyone is really annoyed...” A class climate that was too competitive was viewed negatively.

Competitive balance

Competitive balance referred to a climate in which there is a sense of balance in the competitive nature of the class; it is neither highly competitive nor exclusively for fun. It emerged from meaning units relating to an effective balance. Catriona felt that different activities necessitated either a ‘just for fun’ approach versus a competitive focus:

Certain times, like when we play rounders or summer games you want it just to be fun, but there are other times you want to be competitive like if you play basketball or that you want to try and win from the other time.

Participant’s such as Catriona reported that competition was sometimes appropriate and sometimes it was not, depending on the activity taking place. Louise explained that she liked her class to have an appropriate balance of fun and competition: “Not too competitive, it’s fun and you enjoy yourself more...” Louise felt that an element of competition was good, but not overly so. Catherine had a similar point of view: “Not really, really competitive, but say you’re like having a mini tournament or something you kind of want to win it, but at the same time you want to have more fun...” Catherine explained that the competitive element could positively contribute to the experience of the PA class, but that it was important to her that the class maintained a fun element. Overall, a good competitive balance in a PA environment was viewed very positively by participants.

Positive competition

Positive was defined as competition that is interpreted as having a positive impact on PA. This theme emerged from meaning units in which competition was viewed positively. Anna explained why she sometimes liked a class to be competitive:

I don’t know, it depends what game. But sometimes when it is competitive, like when you are playing rounders and both teams are getting really competitive it makes it more fun, because you’re trying to out beat each other and you end up doing more work.

In this instance, Anna felt that a level of competition helped her work harder in class. This was echoed by Lindsay:

Like you actually like, you like work harder cos you want to win and you like you...like when it's competitive you work harder and you get better grades and stuff because I've done more...like if it was just for fun I'd just like walk about the court and not really care...

Lindsay indicated that a class with a competitive vibe is likely to assist her in increasing her activity level and performance. A certain level of competitiveness was appreciated by some participants in facilitating their PA.

Hierarchical structure of second order theme: Positive atmosphere

A positive atmosphere was defined as; 'one that creates a positive ambiance or mood in the class'. Whilst very similar to the overall concept of class climate, it focuses more on feelings and emotions experienced as a result of a positive class climate. Figure 5.7 illustrated that the theme developed from five first order themes that contained meaning units relating to the positive atmosphere of the class.

Good atmosphere

This theme emerged from several participants' explicit references to a "good atmosphere" and it emerged when they were asked to describe their ideal PA class. Diana felt that: "a good atmosphere." was integral to a PA class, an opinion that was shared by other participants. When asked to elaborate on this, several of the other first order themes were mentioned.

Enjoyable

This theme related to perceptions that a class was enjoyable. Emily explained this: "Cos you've got to enjoy yourself when you're doing it." For Emily, and many other participants, an enjoyable class climate was central to an effective classroom atmosphere. Enjoying the class tended to mean an element of not taking either yourself, or the class, too seriously, as described by Jo: "If you know you're not good at it, like I kind of take a laugh at myself, I'm not that bothered, then, but people know you're having a laugh at yourself they know you're not that bothered about you being as bad, as they know you

know you're bad at it." In this instance, Jo still enjoyed the class even though she wasn't good at it, as she did not take it too seriously.

Fun

Fun was defined as a class that was entertaining and amusing. This theme developed from meaning units describing a fun class or PA classes that have been particularly memorable for being fun. Fun was seen as a factor that would encourage participation, as explained by Julie: "If you have fun, it usually makes you want to like bring your stuff, like and then when you don't bring it you're like, ohhh and I usually phone my Mum..." Julie noted that she would be disappointed to miss out on a fun class, and would make a concerted effort to bring her kit if the class was going to be fun.

Several other participants felt that when their class was fun they were more likely to take part. When asked what makes a class fun, Sasha responded: "Doing things you enjoy, like their classes and like having friends in your class, or your teacher takes part- you always get a laugh out of your teacher..." For Sasha, a fun class meant a multitude of things, many of which are included in other themes, such as type of activity, having friends in class and teacher participation. Becky equated a fun class to a particular activity: "A fun class can also be, like if you play rounders or that, but it was quite funny or that the whole class laughed together and you feel like..." For Becky, she enjoyed rounders and reported a feeling of unity when the class was laughing together which promoted feelings of fun. A fun class was supported by participants and was seen as contributing to a positive atmosphere.

De-motivated

A de-motivated atmosphere related to feelings that people in the class were not 'up for it' or enthusiastic about participating. Molly described a PA class that she felt lacked motivation:

Yeah, like in my classes in like first and second year, you'd get people that weren't very excited about PE, and they'd just skive it or they'd come and they'd just like stand there and wouldn't be really enthusiastic or quite supportive about it, they'd kind of just like stand there, they wouldn't really do anything, they'd just stand there, if they were on a team they'd just kind of stand there with their arms crossed just like looking at the ball and stuff, like if you were playing like

rounders or something they'd just like stand there, they weren't very supportive or enthusiastic about it.

For Molly, this was a negative PA experience. A perception that others in the class did not want to be there and that were not motivated about taking part, was something that pupils felt had a negative impact on the overall atmosphere of the PA class.

Friendly

A friendly atmosphere was one that; 'was sociable and pleasant to be in'. Sally talked about a class that could be described as friendly: "Like everyone in the class getting along with each other like nothing like, you know no enemies and that, and everyone's quite happy to just play." Interestingly, Sally felt that a lack of controversy and conflict within a class contributed to a friendly atmosphere, which led to a positive atmosphere.

Additional first order themes

Figure 5.7 demonstrates that these two themes did not develop into second or third order themes and evolved directly into the overall theme class climate.

Opportunity to learn

This theme was defined as occasions to gather knowledge and experiences. The theme emerged from pupils' references to PA as a chance to learn new skills from both the teacher and fellow pupils. Nadia talked about this: "Teaches other people if they're not as good, you can just show them, well not show them, but they like learn stuff from people who are maybe just a bit better than them and everyone ends up evening out." PA as a learning opportunity contributed positively to an effective class climate in a PA setting.

Opportunity to be less formal

This theme was defined as a chance to be more relaxed and conform to a less strict and prescribed form of learning than in other school subjects. It was developed from meaning units that related to PE being less stringent than other aspects of school life. Trish explained her thoughts on PE being an opportunity for being less formal:

Because you're not in PE, well you are in PE to like work obviously and do sports and stuff, but when you're in a classroom atmosphere you're more tuned in to working and stuff and like not having a laugh and when you're in PE you're

running around and having a good time, if you get what I mean...and not like stuck in the one place...if you get what I mean...

For Trish, PE offered a chance to have good fun and to be less focused than in other subjects. This was a view that was shared by Paula:

In like a subject you've got to concentrate on that subject and PE is one of the only times you can just like run around and like not have to concentrate on one thing apart from the game you're playing or whatever.

Paula agreed that the less formal aspect of PE allowed her to lapse in concentration and this was something that was viewed positively. An opportunity to be less formal was appreciated by participants and contributed to a suitable class climate for PA.

5.8.4 Sub-theme: Characteristics and behaviours of exercise leaders

Figure 5.8 provides an overview of the second and third order themes that emerged under the sub-theme; 'characteristics and behaviours of exercise leaders'. This theme emerged from participants' comments describing any characteristics and/or behaviours of exercise leaders. Figure 5.8a illustrates that there was one third order theme and 14 second order themes. As with the physical environment, the diagram is hierarchical in nature. There was one first order theme that is directly related to the sub-theme without emerging into a second or third order theme. Similarly, not all second order themes develop into third order themes. Due to the high number of first order themes elicited (52), these are not presented in Figure 5.8a. Rather, they are diagrammatically presented under the appropriate second and third order theme result sections.

Similarly to the theme; 'class climate', in order to improve the coherence of the data in the current theme, the emerging second order themes were all labeled as positive characteristics and behaviours. Any negative behaviours and characteristics were reversed so that the label related to not having that negative behaviour or characteristics. It is anticipated that presenting the results in this manner can lead to the development of a synopsis of the ideal characteristics and behaviours of exercise leaders.

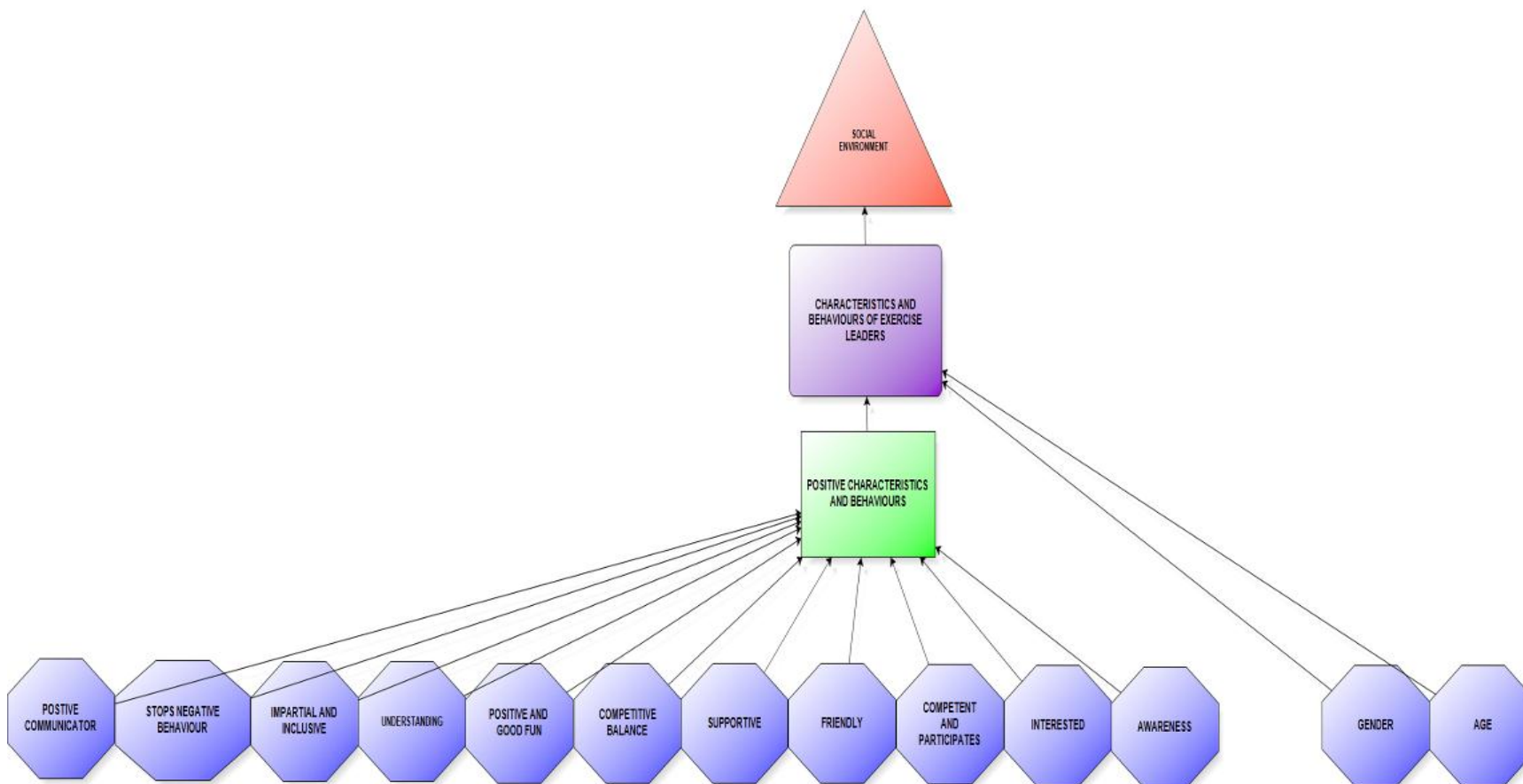


Figure 5.8: Second and third order themes: Characteristics and behaviours of exercise leaders

Hierarchical structure of third order theme positive characteristics and behaviours

This theme was defined as the ideal characteristics or behaviours of an exercise leader. The theme incorporated all statements that related to the positive characteristics and behaviours of exercise leaders. Figure 5.8a illustrates the emergence of 11 second order themes which develop into the third order theme; positive characteristics and behaviours of exercise leaders.

Positive communicator

This theme was defined as communication towards pupils that was encouraging and positive. This second order theme emerged from first order themes that transpired from both positive and negative statements relating to the communication of the exercise leader. Figure 5.9 illustrates that there were eight first order themes that emerged from the data.

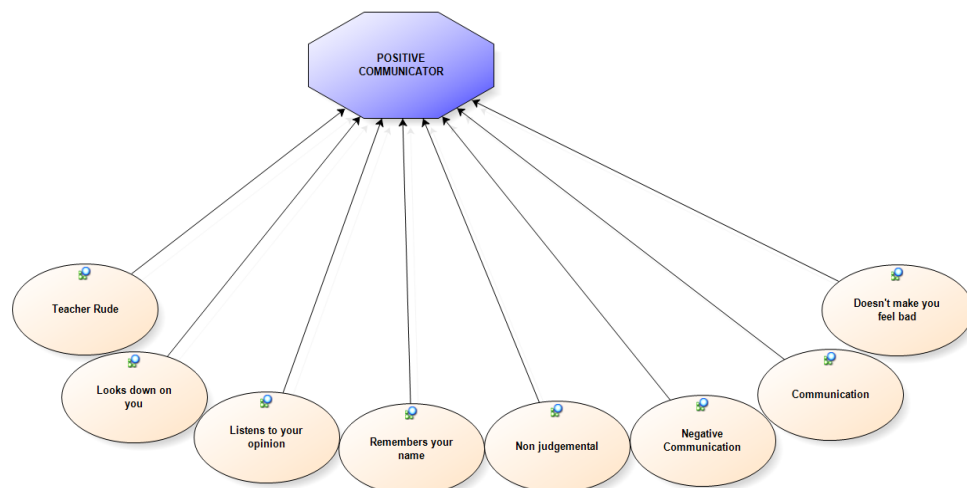


Figure 5.9: Cluster of Second order theme: Positive communicator

Teacher Rude

This theme was defined as a perception of a teacher displaying a lack of manners towards pupils. One participant, Sophie, indicated that if a teacher was rude to her, her motivation to partake in that class was reduced: “Sometimes they’re quite rude to you, like and say they don’t like your attitude...which just makes you not want to do their class cos they’re just going to be nasty to you...” Rudeness was viewed as an unfavourable behaviour of an exercise leader and one that could have a negative impact on PA.

Looks down on you

This theme was defined as a teacher ‘looking down on pupils’ both literally and figuratively. During one exchange, a group of participants discussed the implications of the height of their teacher; whilst Emma did not like having a teacher who was tall as they literally ‘looked down’ on her, Katie noted that teachers of all heights had the ability to ‘look down’ at pupils:

Katie: It depends on how they speak to you and stuff like...

Researcher: So maybe you’re thinking about a tall teacher, who like looks down on you...

Emma: Yeah, I wouldn’t like that cos they make you feel small....

Katie: Yeah but they can still look down on you if they’re small...

Emma:...but like if they look down at you all the time...

It was highlighted that pupils did not like it if their teacher gave the impression of ‘looking down’ on them whether literally or otherwise as it resulting in them feeling ‘small’.

Listens to your opinion

This theme was defined as a teacher listening to the opinions of pupils. Participants indicated that when exercise leaders listened to their opinions, this was viewed positively. This was highlighted by Anita: “It just makes you feel good and like they’re listening to you.” Similarly, Sarah described how being listened to made her feel:

...so we were negotiating with the teachers and they were listening and they were taking what we were saying and putting it in the game, so like what we were saying they were valuing and putting in so it was like...

The participants had a positive opinion of exercise leaders who listened to them and who valued their opinion.

Remembers your name

This theme was defined as a teacher remembering and referring to pupils by their name. The participants indicated that it was important for teachers to remember their name, as demonstrated by Amy: “Like don’t just call you “you” or point.” Sophie felt that it was important as it indicated teachers had an interest in pupils: “Cos they actually care what you’re doing.” Whereas Lucy felt that it confirmed mutual respect: “They wouldn’t be happy if we done that to them so why should they be able to do that to us...” Remembering the name of pupils was interpreted as a sign of respect as well as showing an interest in them and therefore a positive attribute of exercise leaders.

Non-judgemental

This theme was defined as a teacher not being critical or passing comment on pupils’ abilities or efforts. The theme emerged from meaning units that discussed a teacher’s attitude towards their pupils. Being non-judgemental was something that was viewed positively, as discussed by Lucy: “In first and second year the teacher didn’t really judge you or anything, she made you feel like you were equal to anyone else no matter how much effort or like abilities you had.” In this instance, Lucy felt that it was important that the teacher did not treat her any differently to other pupils as a result of her effort or her ability.

Kate talked about a teacher who was did not judge pupils based on ‘issues’ that they may bring to their attention:

Yeah cos if you talk to a teacher, you want to feel like you can talk to them without them judging you, whereas if they’re like why did you come to me with something as silly as that you feel like you’ve done something wrong, but you’ve not it’s the other people who’ve done something wrong, but you feel like really bad for going...

It was viewed positively if exercise leaders did not criticise or pass comment on pupils, regardless of issues or concerns that they may have. Exercise leaders were viewed as communicating positively if they were non-judgemental.

Negative communication

This theme was defined as teachers providing feedback or instruction to pupils that lacked clarity, or as making negative personal comments about pupils. Negative communication was an attribute in exercise leaders that pupils did not view positively. This theme emerged from meaning units that described the impact of teacher's making negative comments towards pupils. An example of negative communication was; 'not being clear when giving instructions to a class', as described by Julie:

Any game we play with Mr Smith, we start playing it and then he's like "you're not playing the rules properly" but then it was like, then he explains them all and then half of them he's just put in then, like...

Lack of clarity in instructing was interpreted as a negative attribute of exercise leaders. Pupils also indicated that it was not favorable when a teacher was negative in relation to their feedback on a task. This was described by Sarah: "Then she'd bring you down and you be like "you don't do it like that"...and you'd be like "thanks!" Pupils viewed feedback such as this as a negative behaviour in exercise leaders.

Susie quoted a particular incident that highlighted the impact that a negative comment had on her:

I used to do highland when I was in primary and when I was stuck my teacher used to come up to me and would be like "oh I don't want to touch you in case you snap" cos I was really, really thin when I was younger and that made me feel like I don't want to do dancing anymore so it made me leave, but I did enjoy doing it, but I didn't get any help because she was making these comments about me...

In this instance, negative comments were viewed unfavorably and highlight that such a comment may discourage participation. A more generic example of teacher's making negative comments was put forward by Rachel: "Yeah. And we also don't like the over confident teachers who are like really in your face and making comments about you trying to be funny to the other of the class and stuff..." This indicates that passing comment on pupils in a negative manner was viewed as an adverse characteristic and behaviour of exercise leaders.

Communication

This theme was defined as the positive communication of teachers as well as general comments relating to communication of exercise leaders. Positive oral communication was viewed by Laura as being loud, but not aggressive: “Like, if their voice is loud but they’re not shouting at you....don’t know...they’re not doing it in a nasty way, as if to say you’re crap, they’re just helping you.” Laura found communication in this manner helpful.

This theme also identified that participant’s viewed communication between pupils and PE teachers as more important than with other teachers. This was highlighted by Anna:

... like tell you to do your work and then you’ll do it and you’ll only really talk to them if you need help, but like with PE teachers you’re like, I don’t know it’s like you’re doing sport with them so you sort of need to talk to them more....

The difference between PE teachers and other teachers is discussed in more detail under the additional first order theme ‘PE teachers different to other teachers’. However, it is important to note here, that communication is explicitly highlighted as an important behaviour of PE teachers.

Doesn’t make you feel bad

This theme was defined as a pupil’s perception that a teacher should not evoke feelings of guilt in pupils even if they have done something wrong. This was explained by Kate:

Like with Miss Brown, sometimes if you forget your joggers by accident and then you tell her, she doesn’t make you feel bad, but you feel bad yourself because the whole team is counting on you cos you’re already in a team, then you it makes you want to bring your stuff.

It can be seen that Kate felt that it was not necessary for the teacher to make her feel bad about forgetting her kit, as she already felt that way. Evoking feelings of guilt was viewed negatively by pupils.

Stops negative behavior

This theme related to comments made in relation to teachers preventing negative behaviour and comments in class. Figure 5.10 illustrates that there were two first order themes that emerged from the raw data.

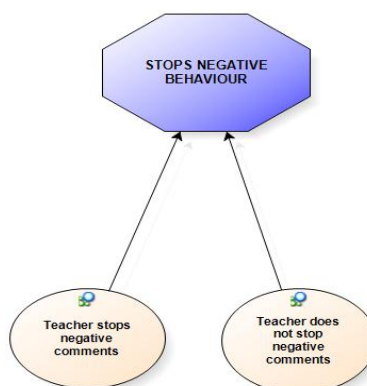


Figure 5.10: Cluster of second order theme: Stops negative behaviour

Teacher stops negative comments

This theme was defined as a teacher being aware of and preventing negative comments made by fellow class members. It emerged from comments highlighting the positive impact a teacher could have in intervening when negative comments were made by other pupils. Lucy explains this:

No, I think it takes a lot of guts, but I think that if it's just, if it happens all the time it might like come down on you, but a teacher can help talk to them and say I've seen you doing it, and don't mention that the person has come to you and said and so it doesn't get you in bother and stuff...

Participants viewed teachers positively when they took an active stance against negative behaviour and comments made in the classroom.

Teacher does not stop negative comments

This theme is the opposite of the previous theme and in this instance; the theme emerged from comments related to a teacher's lack of involvement in removing negative comments from the classroom. Jade described a situation where her teacher did not get involved: "I didn't want to do it after that, cos they were all just like laughing and stuff and I think the teacher did hear it but chose to do nothing about it and I felt really uncomfortable." Not stopping negative comments and behaviour was identified as a

negative feature associated with exercise leaders.

Impartial and inclusive

This theme was defined as a teacher who involves everyone in the class and who is unbiased. It was developed from four first order themes as illustrated in Figure 5.11.

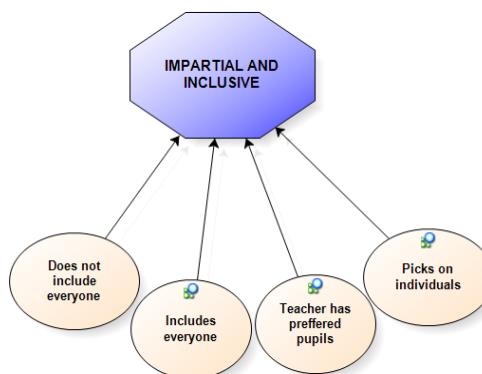


Figure 5.11: Cluster of second order theme: Impartial and inclusive

Does not include everyone

This theme was defined as a teacher who does not involve everyone in the class. Anne felt that some teachers only selected small groups of pupils to take part: “Cos some people just sit about and do nothing, if the teacher is just choosing five people to do something, and the rest of them just sit there and have nothing to do...” A teacher who did not include everyone in the lesson was viewed negatively by pupils.

Includes everyone

This theme was defined as a teacher who involved all pupils in the class regardless of their ability or enthusiasm. Joanna felt that even if a pupil didn’t want to take part in an activity, it would be agreeable if the teacher still involved them: “Well sometimes they know that someone doesn’t like something some of them might let them like ref or something.” A teacher who was inclusive was viewed positively by pupils.

Teacher has preferred pupils

This theme was defined as a teacher who gave individuals or groups of pupils preferential treatment. It emerged from pupils comments related to favouritism. Jessica felt that teachers tended to give preferential treatment during core PE to pupils who took Standard Grade PE: “It makes you feel bad because you didn’t take it...Because sport isn’t everyone’s strong point and you just feel that they favour people that are good at sport.”

In this instance, Jessica believed that she would be treated more favourably if she had chosen Standard Grade PE as a subject. Katie also talked about the impact of preferential treatment:

Not really, cos you just think what's the point if she's already got the people that she likes and the people she know, well she thinks are better than everybody else when she hasn't really had a chance to look at anybody else to see if they're just as good as her favourite people...

A teacher who had 'favourite' pupils and showed them more attention than other pupils was viewed negatively by pupils.

Picks on individuals

This theme was defined as a teacher who singled particular pupils out in a negative way. Whilst the previous theme identified pupils could be picked out and given preferential treatment, this theme identified being singled out for unfavourable attention. Susie referred to being picked on by her teacher: "...if they're like singling you out and they're like "you're really crap at this sport" you get put in a little different group." In this instance, negative attention was drawn towards Susie because of her perceived lack of ability. Emma did not like it when a teacher drew attention to her: "I hate it when you're singled out, when everyone else is doing it and they just shout at you..." In any instance where the attention was placed on one individual to draw attention to their behaviour in a negative manner, this was viewed as a negative attribute of exercise leaders.

Understanding

This theme emerged from two first order themes and is depicted by Figure 5.12. It was defined as pupils' perceptions of their teacher's understanding (or lack thereof) of them.

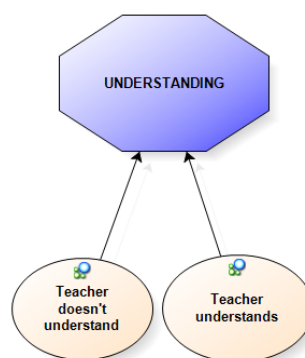


Figure 5.12: Cluster of Second order theme: Understanding

Teacher doesn't understand

This theme was defined as a teacher's lack of understanding and empathy towards pupils. Kayleigh felt that certain teachers were not aware of some of the issues that adolescent girls might face:

Sometimes, because they've not been doing our type of PE for quite a time and they're not so sure of all the insecurities and all that and some of them don't really bother to get involved or to ask what's wrong if you're not as comfortable.

As illustrated by Kayleigh, neither having an understanding, nor trying to gain an understanding of the needs and issues of pupils, was viewed negatively.

Teacher understands

This theme is the opposite of the previous theme. It was defined as a teacher who had understood and was empathetic towards pupils. Alison reported that it was important to have a teacher who understood her: "Teachers who are friendly enough to make it fun and understand the reasons for us wanting it to be fun." In this instance, an understanding of the pupil's motivation was seen as important. Ruth felt that it was important for teachers to understand friendship groups and the impact of not being with that group in a PA class: "If they've got like knowledge of who your friends are so they don't put you in awkward groups, like you're not going to be comfortable with." Ruth highlighted that the teachers lack of understanding about such issues, could lead to feelings of discomfort in class.

Positive and good fun

This second order theme emerged from six first order themes and is illustrated in Figure 5.13. The theme was defined as a teacher who had a positive and fun attitude towards the class, subject and teaching.

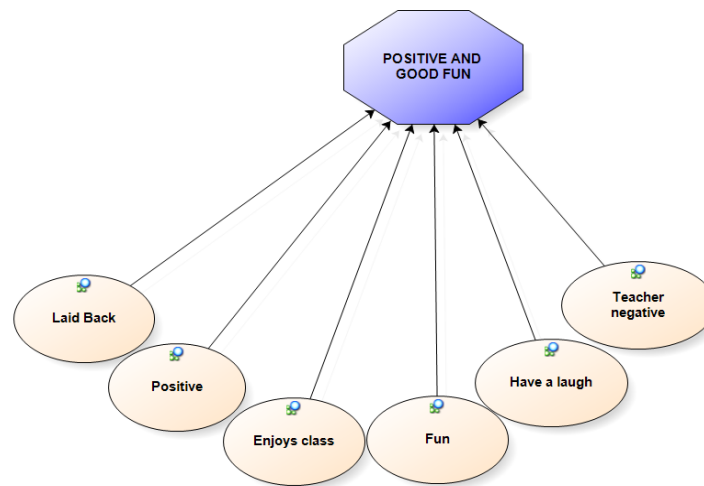


Figure 5.13: Cluster of Second order theme: Positive and good fun

Laid back

This theme was defined as a teacher who was relaxed in their attitude. Participants appreciated their teachers being ‘laid back’. The positivity conveyed by a PE teacher who was relaxed emerged under this theme, something discussed by Ruth:

She acts like your friend, she doesn’t really act like a teacher, so it feels like, it sort of makes you have more fun and makes you relax more, cos you don’t feel like you’re being watched by a teacher, it feels like it’s just your friend.

Ruth mentioned her PE teacher is ‘not like a teacher’. As was previously mentioned, the difference between PE teachers and other teachers is discussed further in a future theme. However, a laid back teacher was interpreted as fun and helped pupils feel more relaxed. Thus it is identified as a positive characteristic of exercise leaders.

Positive

This theme was defined as a teacher who had a positive and optimistic outlook. Pupils indicated that they would prefer their teachers to have a positive attitude. Kate explains why this is important to her: “Cos it rubs off on you how they are, so if they’re like cheery it kind of cheers you up but if they’re moody and depressing it makes you feel the same.” Positivity was perceived as influencing her frame of mind in class. Rachel described the attributes that she felt made a teacher positive:

Like if they're nice to you, you want to do your work and stuff, but if they shout at you retaliate and you like don't want to do it...if they're nice you want to be nice and you don't muck about and stuff cos they're nice to you.

In this instance, being 'nice' was a characteristic viewed positively. Positive behaviour was also described by Vicky:

And we think teachers are good if they encourage you and if they're positive, if they have a positive attitude towards you and if they're professional, if like they're immature, like making comments about you like we've said then it doesn't really make you want to do PE.

In this instance, exercise leaders who convey positivity and encouragement, and who avoid negative comments, were viewed as displaying positive behaviours.

Enjoys class

This was defined as teachers enjoying their class and was identified as something pupils felt was important. Laura highlighted this characteristic when describing her ideal teacher: "Teachers who are enjoying themselves and teach it properly." Pupils viewed teacher enjoyment as a positive attribute.

Fun

This theme was defined as a teacher who was entertaining and good fun. It emerged from meaning units that referred to teachers as fun, it is similar to the previous two themes, but it emerged when pupils were asked to describe their ideal teacher and three groups mentioned 'fun'. However, they did not elaborate further on this.

Nonetheless, Rhona described having a teacher who is not fun: "Cos if they're not fun and nice and they just make you want to work hard all the time and you just wouldn't want to do PE if they were like that." In this instance, working hard all the way through a PE class was not viewed as having fun and therefore was not viewed favourably.

Have a laugh

This was defined as a teacher who had a good sense of humour and was able to 'have a laugh'. Rachel explained that when she made a mistake, it was important that her teacher did not take it too seriously: "If you do something wrong, you'll start laughing and then she'll start laughing." It was noted that as long as pupils were doing the work, then teachers should be able to 'have a laugh' with them. There was a consensus that whilst teachers should maintain an air of authority, it is important that they are able to inject an element of humour into the class, as explained by Kelly: "...obviously they're a teacher, but they still have a laugh and like talk to you and..." 'Having a laugh' was identified as a positive attribute of exercise leaders.

Teacher negative

This theme was defined as a teacher who portrayed negative behaviour. This is in contrast to conveying negative communication which was previously presented. 'Teacher negative' emerged from meaning units which highlighted participants were not appreciative of characteristics and behaviours that were negative. Vicky gave an example of such behaviours: "Well if they're constantly like grumpy and stuff and getting angry at the slightest of things, it doesn't really make your time in like PE very fun..." In this instance, being grumpy and getting easily aggravated, were viewed as negative behaviours. Joanna described the impact that having a negative teacher had on her:

It kind of makes you feel down as well, as if, if they don't like PE, why should I do PE or why should I like PE if they don't even like it and they're my teacher...so they kind of influence you as well like how you do well in that subject or whatever.

For Joanna, when a teacher conveyed a negative image about the PE class, this had a negative impact on her and her motivation to participate. Kirsty described the impact that angry behaviour could have on her: "And like if they're angry, then that sort of thing rubs off on you so then you, just like get in a bad mood and you don't enjoy it at all and you just want it to be over." For Kirsty, an angry, negative teacher effected her enjoyment of the class. When a teacher displayed and conveyed negativity this was perceived as a negative characteristic.

Competitive balance

This second order theme emerged from two first order themes and is illustrated in Figure 5.14. It was defined as a teacher achieving a balance in their competitive nature. It emerged from meaning units containing references associated with the competitiveness of the exercise leader, rather than the competitive nature of the class itself.



Figure 5.14: Cluster of Second order theme: Competitive balance

Too competitive

This theme was defined as an exercise leader who was highly competitive. Several participants remarked that they did not enjoy it when their exercise leader was overly competitive. Anna described her experience with a competitive teacher:

Like, if they get really competitive, if they force you to do more and more that you can't do, so if they're still really competitive then you kind of stop and you go in a big mood, cos that's happened to me once.

When the teacher was viewed as too competitive, this was seen as a negative attribute of the PA leader. Pupils felt that it made the class 'too serious' and removed the element of 'fun'. Participants also noted that a teacher who was too competitive could come across as arrogant about their own ability, something explained by Susie:

If the teacher thinks they're better than you, like I don't know, say you're playing basketball or something and the teacher is an ex-amazing basketball player or something then he or she is like oh I'm amazing I can do basketball, just being like that.

A teacher displaying this sort of self-important behaviour was viewed negatively by pupils.

Competitive

This theme was defined as a teacher who was competitive, but not overly so. This was a characteristic that was viewed positively. Sarah felt that a teacher who was competitive: “Pushes you to your full potential.” Similarly, Anna felt that a male teacher was more likely to be competitive and push her to reach her potential:

Anna: Sometimes male teachers expect more from you

Researcher: Is that a good thing?

Anna: Sometimes cos it pushes you

Anna felt that having a competitive teacher, who was male, could sometimes be beneficial. A level of competitiveness displayed by exercise leaders was viewed as beneficial in motivating pupils.

Supportive

Figure 5.15 depicts the second order theme ‘supportive’ and illustrates that it was developed through three first order themes. The theme was defined as; ‘the perceived supportiveness, or lack thereof, of the exercise leader’.

Supportive

Whilst it was difficult to define this theme, several of the groups noted that their exercise leader should be “encouraging” and “supportive” and thus the theme was defined as such. The theme was developed when participants were asked to describe their ideal PA leader and is illustrated in figure 5.15. Both of these characteristics were viewed as positive features of an exercise leader.

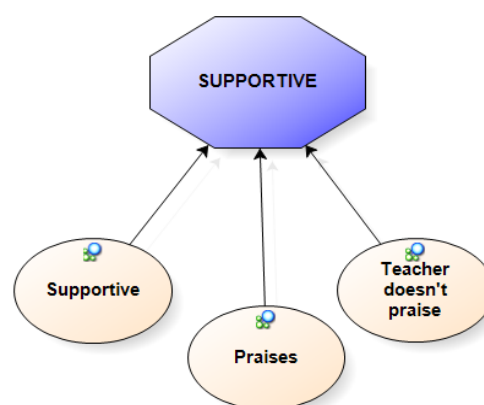


Figure 5.15: Cluster of Second order theme: Supportive

Praises

This theme was defined as a teacher who drew attention to a task that had been performed well and applauded it accordingly. Such praise was appreciated by Lucy:

Like if you make the most whole runs or whatever, at the end of the class they make you noticed to the whole class, like they tell you like well done you've made the most home runs, it makes you feel better that you've performed well and all that.

Lucy felt that being praised made her feel better. These thoughts were echoed by other participants, and thus, praise was identified as a positive quality of an exercise leader.

Doesn't praise

This theme was defined as occasions when an exercise leader did not praise pupils or highlight their achievements. It was seen as a negative characteristic. Anne described how a lack of praise from her teacher made her feel: "It makes you quite upset, because they probably made somebody else stand out and you maybe feel like you've performed better than them and then they've not like noticed you." In general, a lack of praise was not viewed favourably by pupils and did not contribute to the overall view of a supportive teacher.

Friendly

This second order theme is illustrated in Figure 5.16. It emerged from four first order themes which were developed from statements relating to the familiarity of the exercise leader to the pupils. It was defined as a personable and friendly exercise leader.

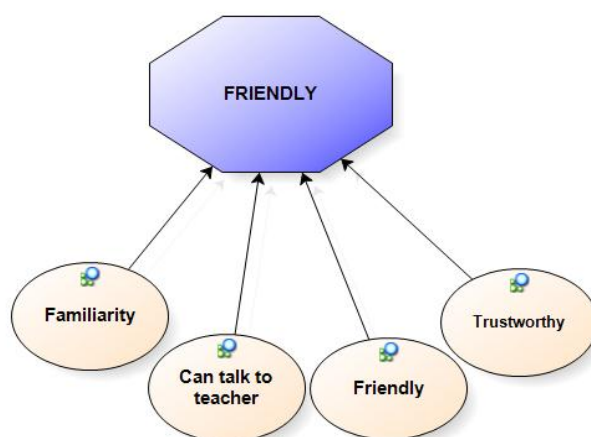


Figure 5.16: Cluster of Second order theme: Friendly

Familiarity

This theme was defined as a teacher who was comfortable and personable with pupils. A sense of familiarity between the teacher and pupils was deemed important by the participants. Some participants, such as Emma, felt that when a teacher was more familiar with the class, they were more like to encourage them: "...when they know different groups of people they encourage them more..." Pupils also felt that the teacher could understand them more if they knew them, as explained by Anna: " helps them to like understand you as a person, it goes like both ways a teacher and a pupil, it helps like both ways..." Anna felt that a class may be more responsive if the teacher displayed an understanding of their needs. Susie felt that if she did not know the teacher, then she was likely to feel less comfortable in their class:

Because, they know you and will feel uncomfortable with a new teacher coming in, cos sometimes they don't know groups of people, the PE teachers know who you are more so you feel more comfortable doing stuff in front of them.

Susie felt that if she knew her teacher then she was likely to feel more comfortable taking part in PA in their presence.

Can talk to teacher

This theme emerged from meaning units in which pupils expressed a preference for teachers that they felt they could talk to. Rachel believed that a teacher who she could talk to was helpful: "It can help like if you need to talk to someone, who will listen to you." Rachel found a teacher who listened to her, helped her to talk openly with them. Similarly, if pupils felt that they could talk to a teacher without being judged, this was viewed positively, as explained by Jess:

Yeah cos if you talk to a teacher, you want to feel like you can talk to them without them judging you, whereas if they're like why did you come to me with something as silly as that you feel like you've done something wrong, but you've not it's the other people who've done something wrong, but you feel like really bad for going...

Not judging pupils was discussed in an earlier theme, in this instance the pupil felt she can talk openly with the teacher and was not worried about talking to the teacher about any issue. Open communication between teacher and pupil was viewed positively.

Friendly

When asked to describe their ideal exercise leader several of the participants noted that they would be 'friendly'. When asked to elaborate further on the notion of 'friendly', Kate explained it in the following way: "To be there to help you and show you what to do and if you forget your kit or something then or you're not doing something properly they don't like have a go at you or anything, they like just help you through it." As with other themes, a helpful teacher, who assisted pupils, as opposed to adopting a more formal and critical approach, was viewed positively by pupils.

Ruth felt that it was important for teacher-pupil relations for the teacher to be friendly: "...it's better if they're friendly so you get on better with them, so it makes it more like comfortable." In this instance, Ruth felt more comfortable around a teacher who is friendly. A teacher who displays friendly behaviours towards pupils was highlighted as displaying positive characteristics of an exercise leader.

Trustworthy

This theme was defined as an exercise leader one was confident in, and can depend on. Claire explained how a relationship of trust was developed between her and her teacher:

I quite like it when you're talking with teachers about non school stuff cos you don't feel like real awkward around them, you feel comfortable enough to talk about non school stuff or what you're doing at the weekend it's a lot, you seem to trust the teacher a lot more because they seem a bit more interested than just school stuff.

A teacher being interested outside of school is discussed in another theme, but at this point, it is worth noting that it is the trust that comes from this interaction that appealed to Claire. Trust was a characteristic in exercise leaders that is appreciated by pupils.

Competent and participates

The second order theme competent and participates emerged from four first order themes and is illustrated in Figure 5.17. The theme emerged from four first order themes and was developed in relation to the capabilities of the exercise leader and their involvement in the class.

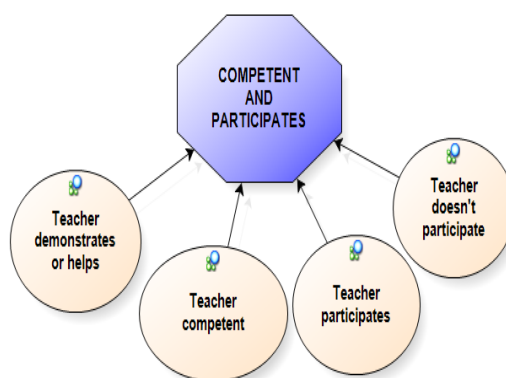


Figure 5.17: Cluster of Second order theme: Competent and participates

Teacher demonstrates or helps

This theme was defined as a leader who demonstrated activities or helped pupils with activities. Ruth explained how a teacher could help her:

Cos the teachers always give us help when we're fielding, like come on fielders and they'll always give us ways we can improve our game and how we can get a lead and stuff, but they'll also help the other team, so it's fair, but they also get you a bit psyched up about it, you're like we've got a great game plan we need to win, it gets you worked up about it, but still in a fun way so you're not like oh we've got to win.

In this instance, the teacher highlighted areas for improvement as well as encouraging pupils to develop a strategy to win the game. Importantly, the teachers were fair with their help and maintained a sense of fun when imparting advice. Pupils were appreciative of patient teachers who took their time with individuals. Anna, felt that it was important for the teacher to demonstrate how to perform a task if she was finding it difficult: "Like help you if you're stuck, like if you don't get how to do a lay up or something they'll like walk you through it and say "do this" to make it better, so then you'll get it right..." Taking

time, helping pupils, and demonstrating how to perform activities were all viewed as positive characteristics of exercise leaders.

Teacher competent

This theme was defined as a leader who is competent in the activity they are teaching. Katie explained why she felt competence in an activity was important:

Dunno, it's a bit like a German teacher who can't speak German, you need someone who is teaching something to be good at it, if they're trying to teach you to be good at something, you can't have someone who can't do it themselves kind of thing...

In this instance, Katie highlighted the importance of the credibility of the teacher amongst pupils. Susie explained that it is sometimes better to have an exercise leader with specialist skills: "If you got instructors in schools for things like dance, instead of teachers just making things up then you're getting someone who's specifically trained in that one thing." Susie explained that sometimes it can appear that a teacher is 'making up' what they are teaching, and in such instances, it would be beneficial to have an expert in the area instead. Overall, being competent was something that pupils viewed positively.

Teacher participates

This theme was defined as a teacher who takes part in a PA class. Teachers who participated were viewed more positively than those who did not. Lucy explained why she felt it was important for a teacher to take part in her lesson:

It's easy enough for them to sit on a bench and shout orders at you and tell you how to do it and that, but if they're joining in you can see that they actually know what they're talking about and they can play it and they're not just shouting at you.

The teacher is viewed as having empathy with the pupils as well as proving their credibility to them. Sophie enjoyed it when her teacher took part in the lesson: "... like sometimes it's better when they're up and running about-with you and it encourages you to take part as well." Sophie felt that having a teacher who is involved could encourage her to participate in the activity. Overall, teacher participation is a positive behaviour of

exercise leaders.

Teacher doesn't participate

Just as a teacher who participates is viewed positively by pupils, an exercise leader who does not take part in the class is viewed unfavourably, as Anne explains: “It depends, she’s nice, but it’s a bit boring as she just sits there and says, rounders, gets teams, play, stop...and she just sits and talks the whole time...” When the exercise leader does not take part, Anne views her as boring, just sitting at the side is not viewed as a positive behaviour. Katie, highlighted the impact that her teacher not taking part can have on her: “What’s the point in us trying to do it if they’re not showing us what to do properly or that.” For Katie, she can be de-motivated if her teacher is not participating. Non participation by exercise leaders was identified as a negative behaviour.

Interested

‘Interested’ was a second order theme illustrated in Figure 18. It was developed through the emergence of two first order themes which related to an exercise leaders interest in the participants. The theme was defined as a teacher who showed concern and paid attention to pupils.

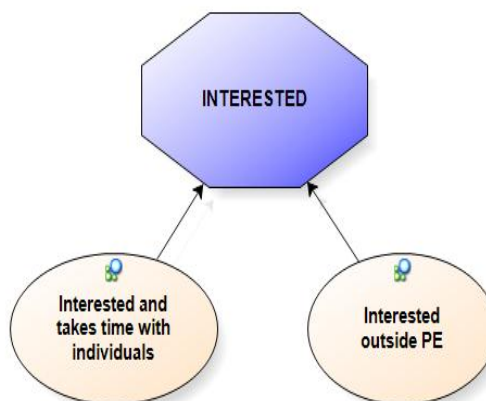


Figure 5.18: Cluster of Second order theme: Interested

Interested and takes time with individuals

This theme was defined as a teacher who paid attention to pupils and took time to understand them and their needs. The theme reflected the views of participants who felt that it was important for their exercise leader to be interested in them, as described by Lisa: “They take an interest in what you want to do and in what you are doing...” A teacher who cares about what a pupil wants to do, and who is involved in what they are doing, is viewed in a positive manner. Emma felt that it is important for teachers to take

their time with individuals: “Taking the time to watch you and make sure that you’re doing it right and make sure you’re all doing it properly and all know what you’re doing in the sport...” Observing individuals and taking time to check their progress was something that participants felt was important.

Interested outside PE

In addition to taking an interest in pupils in class, it was highlighted that it was an important attribute of a PE teacher to take an interest in pupils out of the classroom. Joanna discussed an incident in which her teacher took an interest in her outside of class:

...we went to a basketball game once and we just got talking to the teacher, we were sitting on the bus and just started talking about things that are happening at home and you don’t know how to fix them like with your family or something, something’s happened in your family or something and you can talk to them and they can maybe tell you about something that’s happened in their past and how they dealt with it so it can help you deal with your problem as well.

In this instance, the PE teacher was viewed as someone who can help pupils to solve problems they may be facing. A PE teacher who talked to about issues outside of school was also mentioned by Jenny:

I quite like it when you’re talking with teachers about non school stuff cos you don’t feel like real awkward around them, you feel comfortable enough to talk about non school stuff or what you’re doing at the weekend it’s a lot, you seem to trust the teacher a lot more because they seem a bit more interested than just school stuff.

Jenny explained that she felt that she could trust her teacher more because he / she showed an interest in her outside of school. She reported that she felt more comfortable around her PE teacher because they showed more of an interest in her. Showing an interest in pupils regarding their PA as well as other areas of their life was highlighted as a positive attribute.

Awareness

The final second order theme in this hierarchical structure was ‘awareness’. Figure 5.19 illustrates the themes development from two first order themes. The theme can be defined as a teacher who is alert and conscious of everything going on in the classroom.

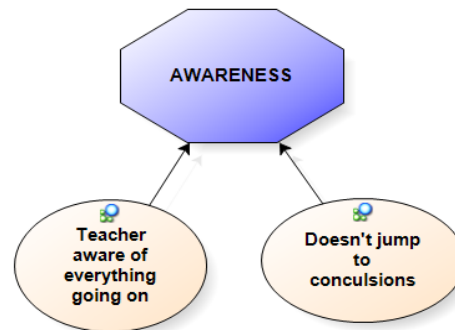


Figure 5.19: Cluster of Second order theme: Awareness

Teacher aware of everything going on

This theme referred to a teacher who was alert to everything that happened in their class. Pupils were concerned with a teacher’s level of fairness in the class and as such they felt that they had to be aware of everything that was going on in the classroom, as explained by Kayleigh: “...making sure they know exactly what’s going on and catching people when they’re not playing to the rules.” Pupils did not approve of teachers who lacked awareness in the classroom.

Doesn't jump to conclusions

This theme was defined as teachers who were conscious of all events taking place in their classroom. Pupils felt that it was important for a teacher not to jump to conclusions in class. Amy highlighted an incident during which she felt her teacher jumped to the wrong conclusion:

...like sometimes we played this game where you can run but you don’t have to and I’d like ran the last couple of times and I was sitting down for a rest and then they yelled at me to like go and run and I was like I’m not running this time and then they gave me a row and told me to get running again...

Incidents such as this were not supported by pupils; they felt that a teacher should ask for their point of view and listen accordingly.

Additional first order themes

Positive characteristics of exercise leaders also contained two first order themes that did not emerge into second order themes as illustrated in Figure 5.20

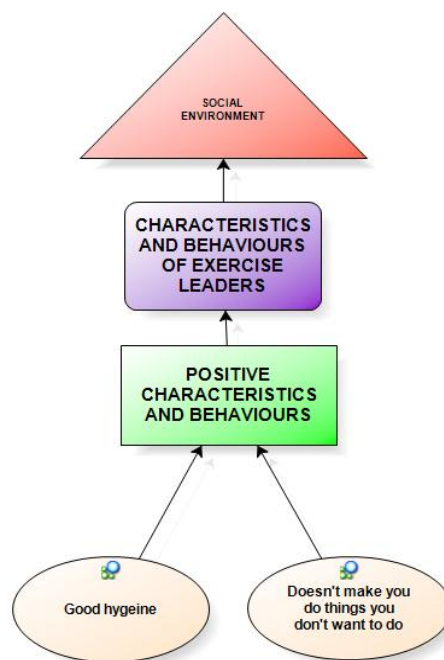


Figure 5.20: First order themes: Good hygiene and does not make you do things you don't want to do.

Good hygiene

This theme was defined as a teacher who was clean and did not smell. Pupils felt that it was important for their exercise leader to have good hygiene. Anita explained the impact of a teacher with poor levels of hygiene:

Makes the classroom absolutely disgusting...and walking past them you smell BO and who wants to have someone who stinks walking past you...it's so unattractive towards everyone...like say someone has really bad breath and you're sitting talking to them it's like really horrible if you've got to like sit and smell a breath, like you don't want to be rude, but someone with big sweat patches and that it's just like really disgusting...and then you think you smell cos you're in the same classroom as them...

A teacher with bad breath or bad body odour was viewed negatively by pupils. Pupils such as Lisa felt that PA leaders could enhance their personal hygiene: "they should have showers for themselves; if they're doing PE six hours a day they should have a shower

after three hours or at least change their clothes.” In this instance, it was viewed positively if the exercise leader changed their clothes or showered.

Doesn't make you do things you don't want to do

This theme was described as; ‘a teacher who did not force pupils to take part in activities they did not want to do’. Some participants did not like it when an exercise leader enforced mandatory activities, as described by Kate:

Like say swimming, like they say you always have to take part in it cos it's part of the course you have to take part in it, but if you really don't like swimming and you don't have a note or a genuine reason then they still make you do it.

Not all participants shared Kate's view; however, some pupils did feel that exercise leaders should not be able to force them into taking part in PA. Forcing pupils into an activity was viewed as a negative attribute of exercise leaders.

Additional second order themes

There were two second order themes that emerged directly into the sub-theme as illustrated in figure 5.8a. These themes are not presented as favourable characteristics and behaviours, but rather as factors that were identified as having a potential impact on PA participation.

Hierarchical structure of second order theme: Gender

This theme emerged from three first order themes, as illustrated in figure 5.21. This theme referred to the sex of the teacher taking the PA class.

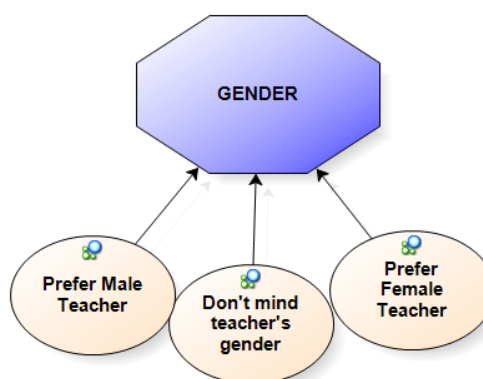


Figure 5.21: Cluster of second order theme: Gender

Prefer male teacher

This theme was defined as a preference for a male PA leader. Having a male teacher was preferred by some pupils as they felt that it had an impact on their motivation levels, as explained by Jude: “Having a male teacher...makes you want to try harder and like make you want to like, they push you more than female teachers.” Jude felt that male teachers would push her more than their female counterparts. Anna shared a similar view point and this is shown in her discussion with Rachel:

Anna: I think I worked harder cos he was a guy...

Rachel: Is that cos he was hot..!

Researcher: Do you think you work harder with guy teachers...

Anna: It depends what they look like I think...I know it's bad but I think everyone is thinking it secretly...

Researcher: What do you mean...

Anna: Like if there is a good looking teacher and everyone is like ‘Oh my God’ and you want to work hard and impress him and you want to like get this sort of enthusiasm about PE...

Anna felt that she, and other pupils, were more likely to work hard in a class which was led by an attractive male. Anna felt that pupils would be more eager to please such a teacher.

Don't mind teacher's gender

This theme was defined as pupils not having a preference for the gender of their PA leader. There were several pupils who did not mind if their teacher was male or female, such as Lindsay:

...I've had like a male and a female teacher and they treat you just the same way. It depends, because some teachers are laid back which are male or female and others are... want to push you so you do something in PE...

Lindsay felt that there were no major differences in the way male and female teachers treated her. Lindsay felt the way a teacher may behave was more likely to be dependent on their personality rather than their gender. Kate shared Lindsay's view point and when asked if she would prefer a male or female teacher, she indicated that she did not mind: "I don't really mind...I'm not really that bothered..." Overall, some pupils did not mind the gender of their PE teacher.

Prefer female teacher

This theme was defined as a preference for a female teacher. Louise explained why she preferred having a female exercise leader:

With like my teacher for Standard Grade it's like a woman so she's a lot nice... I feel a lot more comfortable and when I had problems with people making comments I went and talked to her and she was like yeah, I'm glad you came and spoke to me like I felt I could talk to her more...like if it was a guy I don't know if I would really like have that...

Louise felt more comfortable with female teachers, especially discussing problems with them. Being able to talk to ones exercise leader was something that was discussed in more detail in a previous theme. Finally, Louise indicated that she did not think she could have the same relationship with a male teacher, a view shared by Emma, Ellen and Sarah:

Emma: I've never had a male teacher, but I don't want a male teacher at all

Researcher: Why's that ?

Ellen: I think it puts me off it, having a male teacher

Researcher: In what way ?

Ellen: I don't know, it just, it's just something about a male teacher, just doesn't...

Sarah: I don't feel as comfortable

These girls would prefer a female teacher to a male teacher with the girls reporting that they may be put off, or feel less comfortable, with a male teacher.

Hierarchical structure of second order theme: Age

This theme emerged from two first order themes as illustrated in figure 5.22. It was defined as the age of the exercise leader.

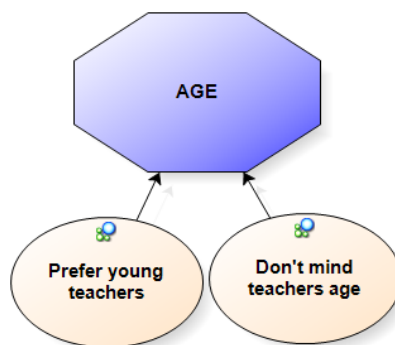


Figure 5.22: Cluster of second order theme: Age

Prefer young teachers

This theme was defined as; ‘a preference for exercise leaders who were ‘young’’. Whilst the pupils did not define the age of ‘young’ teachers, the researcher observed that this tended to be teachers under the age of 35. Participants such as Anna, felt that a younger PE teacher was likely to be more energetic than an older teacher: “No, but, young teachers are more energetic and they’re more encouraging because they’re younger...” Anna also felt that younger teachers would encourage her more.

Pupils, such as Susie, felt that younger teachers were more understanding of their needs than older teachers:

Cos if you like can’t do PE for a certain reason and you have one of the older ones they’re like “oh you can still do it, in my days you could do it” and the young ones will be like “oh ok, just do it next time” kind of thing, they’re like more your age so they like understand kind of recent, but not like recent they know what you like and they’re not pure like 60...

A teacher who understood and appreciated the needs of pupils was discussed in more details in a previous theme. However, it is important to note that some pupils felt that younger teachers were more likely to possess these favourable attributes than their older colleagues.

Don't mind teacher's age

This theme was defined as not having a preference for the age of the exercise leader. When pupils were discussing the age of their teacher, several remarked that they did not mind what age their exercise leader was. When asked to describe their ideal exercise leader, some pupils, such as Jo, felt that other attributes were more important than age: “Kind, smiley, friendly, considerate, young or old”. For many pupils, they did not mind what age their teacher was, as long as they had many other favourable behaviours and characteristics emerging in the current study.

Additional first order theme: PE teachers different to other teachers

This was a singular first order theme that emerged directly into the sub-theme as illustrated by figure 8q. It was defined as PE teachers being referred to as different in some way to other teachers.

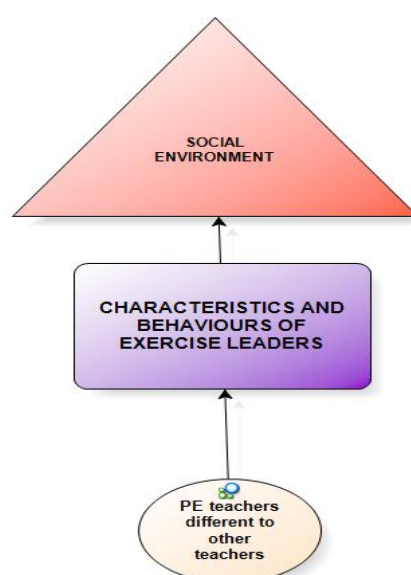


Figure 5.23: Additional first order theme: PE teachers different to other teachers.

Several pupils remarked that they thought that PE teachers were ‘different’ to other teachers and that this was important to them. For example, Jude felt that she was more likely to have a ‘friendly’ relationship with her PE teacher than other teachers: “Yeah, it’s not like...like I don’t know you can just be more like friends with them instead of them ...like you just have a different kind of...” A teacher who was friendly, was identified as a positive attribute in an earlier theme. Many pupils had difficulty articulating the difference between PE teachers and other subject teachers but Lucy tried to explain it:

I think cos it's a different environment, cos you're sitting down and if you're like talking like the maths teacher or any teacher would be annoyed, but I think like a PE teacher I think it's a different environment cos it's more like sporty and different, but they'll like still give you rows and stuff, but it will be like a bit different, cos they want you to get on with your work, but your work in PE is like more fun so you'll probably want to do it more...

It is evident from this statement, that Lucy felt that the physical environment of PE and the very nature of PA then had an impact on the relationship between teachers and pupils, which was different than in other subjects. Finally, Catriona felt that the nature of PE also necessitated more communication with teachers than in other subjects: "With PE teachers you need to like to talk to them more than you do like other teachers..." The issue of communication was discussed in an earlier theme. Overall pupils felt that teacher behaving differently to other subject teachers was important.

5.9 Discussion

The current study and previous chapters have outlined that SCT proposes a triadic relationship between the individual, the environment, and behaviour. In line with this, the role of the environment on PA behaviour has recently received increased attention from PA researchers. A thorough review of the literature revealed that despite growing research in the area, there is still a lack of understanding about the precise environmental requirements for adolescent girls' school PE classes. The current study was designed to identify the environmental factors that adolescent girls in Edinburgh and East Lothian perceive as influencing their PA behavior within PE. This section discusses the factors identified in the results section, in relation to previous and future research.

5.9.1 Context of the findings

Whilst the influence of the environment as a whole (in contrast to simply the school environment), on PA is of interest, it was perceived by the research group, as 'too broad'. Further, in the current study, the practicalities, as well as an effort to keep the research as focused as possible, meant that the school environment was targeted as the area of interest. It is anticipated that the current study has gone some way to providing a basis for future research relating to the role of the environment and PA in adolescent girls. Future research may look to examine this relationship out with the school environment and this is welcomed. In saying this, the quantity of the findings far exceeded the expectations of

the research group; it is proposed that future research would do well to examine each of the key emergent themes in the current study in isolation. Nonetheless, it is suggested that the current study provides a valuable framework, from which future research can be based, it also illustrates the comprehensive nature of the findings.

The results showed the emergence of two main environmental themes perceived as influencing PA in adolescent girls; the physical and social environment. Within the main theme of social environment, the two sub-themes; class composition and class climate emerged. Social support (which had been proposed as an additional sub theme), did not emerge as a stand alone sub-theme, but rather, emerged throughout various first, second and third order themes across each of the other three social environment sub-themes. Characteristics and behaviours of exercise leaders emerged as a third sub-theme of the social environment. In relation to the aim, the qualitative results provided rich insight into the environmental factors adolescent girls perceive as influencing their PA behaviour. The results suggest that the physical environment and social environment are environmental factors within the school PE environment that this population perceive as influencing PA.

The literature review highlighted that research specifically focused on the school PE environment in relation to PA behaviour is limited, and for this reason, direct comparisons between previous research in this area was sometimes not possible. However, this is not viewed as a limitation, but rather highlights the positive step taken in the current study; it has produced findings that relate to the specific environmental needs of a particular population, as recommended by Phonogran et al. (2007). Despite the lack of research concentrated explicitly in this area, it is apparent that there has been considerable research conducted on each of the main themes and sub-themes, but in most cases it has not been concentrated on school PE and / or adolescents. Prior research conducted on the main themes, and sub-themes are used as a basis for discussion and comparisons with the environment and population of interest are made wherever possible.

5.9.2 General findings

The notion that the physical and social environment influences PA behavior (Booth, et al., 2000) was supported in the findings of the current study. Results highlight the school environment as a perceived influencing factor on adolescent PA. This is in line with Fein

et al. (2004) who proposed such a relationship. The findings also support the suggestion of Durant and colleagues (2009), who suggested that specific components of the school environment (such as type of activity offered or size of class) should receive more research attention: Themes proposed by Durant et al. (2009), were reflected in the findings of the current study. These and other emergent themes are now discussed in relation to relevant literature.

5.10 Physical environment

The current study aimed to establish if adolescent girls perceived material objects and facilities present in their PE class, to have an impact on their PA behaviour. The physical environment emerged as a key factor perceived as influencing PA behaviour. This supports recent PA research that has identified the physical environment as an important area of investigation (Gebel, Bauman & Petticrew, 2007). Further, this result strengthens the aforementioned indication of a link between the generic physical environment and PA in youth (Sallis, Prochaska & Taylor, 2000; Dowda McKenzie, Cohen et al, 2008). In relation to the specific physical environment of schools and PE, each of the emergent third order themes, and stand alone first and second order themes, under the overall theme ‘physical environment’, are now discussed in relation to previous research and the potential implications for future research are proposed.

Appropriate Activity

The appropriateness of the activity being conducted during PE emerged as factor perceived by the participants as influencing both PA behaviour and individual correlates of PA. This finding supports the findings of Chow et al. (2008), who identified subject matter as an environmental correlate of PA in 9-12 year olds. Participants in the current study had a variety of views as to which form of activity they were, or were not, in favour of and there was no consensus reached in relation to the popularity of particular modes of activity. That is, there were contrasting views regarding the appropriateness of team or individual, or traditional or nontraditional activities. This highlights the importance of targeting individual preferences for PA, as well as underlining the difficult job teachers are faced with when developing the curriculum. The reasons participants provided for liking or disliking an activity were varied, further highlighting the interdependent role of individual factors on PA behaviour. Many of these reasons are discussed in the social environment section.

More recently, dance has been promoted as a viable way for promoting PA in adolescent girls (www.ydance.org). Whilst some participants had favourable views regarding dance as a form of PA, it was apparent that several participants felt uncomfortable, and out of place during this activity, especially if they did not take part in dance as an extracurricular activity. Consequently, it is suggested a level of caution should be given to promoting this form of PA, over others, to adolescent girls, particularly if they do not partake in dance outside the school PE environment. In addition to dance, swimming was reported as an activity in which participants could feel uncomfortable. Some participants noted feeling uncomfortable during swimming, however the reasons behind this tended to be more socially orientated, and are thus discussed in more detail under the social environment section.

The study reported that some participants enjoyed activities that were less structured, and more independent (e.g., gym work, jogging) than more traditional forms of PE (i.e. netball, swimming). This is in line with Burke and colleagues (2006) who offered university students a variety of PA options and reported that the most favoured form of PA was exercising with others outside of a structured class setting. It also supports the findings of King et al. (1990), and Wilcox et al. (1999), who report that many people do not enjoy structured exercise classes. Further, both Daly and Manard (2003), and Parfitt and Gledhill (2004), reported more positive results in relation to PA and correlates of PA when participants were offered a choice in relation to the form of exercise on offer. Nonetheless, consideration has to be given to this finding as it relates to a school setting which by its very nature, promotes structured classes.

Offering participants a mixture of activities, rather than set weekly activities was viewed positively. Pupils reflected that having a variety of activities available sustained their interest in PE. Participants also commented that they felt it was important that activities on offer were suited to them and their needs, rather than generic PA choices. It could therefore be suggested that having an 'open' PA session could be a means of promoting PA. In saying this, team building was viewed positively; during team building, pupils reported they were being physically active, but the emphasis is on team building and fun rather than PA. Given that 63% of Scottish girls reported that they take part in activity for fun (Inchley et al., 2010) it could be suggested that promoting PA in this manner may be more effective than promoting performance aspects of some PE activities.

Choice of activity was highlighted as a factor which this population perceived as important in influencing PA behaviour. This finding supports anecdotal evidence from the FFG (2008) project which suggested that offering adolescent girls their preferred type of activity led to increased participation levels. Further, FFG (Inchley, et al., 2010) reported that 73% of Scottish school girls felt that PE would be enhanced if there was a wider variety of activities. The current study also reflects the findings of Hohepa et al. (2006), and Smith et al. (2009), who reported pupils perceived choice of activity as a positive component of the PE experience. Smith et al. (2009) also reported that it led to increased enjoyment and engagement in PE.

In the current study, pupils commented that having the ability to choose appropriate activities meant that they were more likely to enjoy and be happy in the activity they were doing. As a result, they were more likely to be comfortable; there was less of a feeling of being 'forced' to take part. This suggests that participants perceive activity 'choice' as influencing personal correlates associated with PA, but this relationship was not explicitly examined.

The findings in the current study also reflect previous research conducted by Parfitt and Gledhill (2004) and Daly and Maynard (2003) who identified choice of activity as influencing perceived affect. The current study also goes some way to supporting Pruska et al.'s (2004) research which reported that increasing choice to adolescent girls in PE led to greater intrinsic motivation, higher regulation and experiencing less external control and less amotivation. Further, the recommendations of Ntoumanis and Standage (2008), relating to teacher feedback, propose that offering students opportunities for choice and input is a means to enhance the motivational environment; providing choice of PE activity may be one way of offering choice and the findings of the current study support this recommendation. Fun and enjoyment, have been identified as key correlates of PA (Dishman et al, 2005, Whitehead and Biddle, 2008, PASS, 2008), and it has previously been reported that increasing choice, leads to greater enjoyment and engagement in PE (Smith, Green & Thurston, 2009; Pruska, Treasure, Darsf & Pangrazie, 2004). The findings presented in the current study support this relationship.

Appropriate resources

Suitable facilities emerged as a factor participants perceived as important in the physical environment. It was reported that inappropriate facilities and equipment could lower a

participant's desire to be physically active, as well as, the actual quality of their PA experience. In general, a lack of equipment was seen as a hindrance to being physically active. Similar findings were reported in relation to neighbourhood PA facilities (Sallis, Prochaska & Taylor, 2000) where a positive relationship between access and opportunities in relation to PA was found. Similarly, Dowda et al. (2007) and Pate et al. (2005) reported a positive relationship between greater availability of neighbourhood facilities and MET PA. Whilst the current study was not concerned with neighbourhood physical environment, it goes some way to supporting the relationship between the perceived availability of resources and PA behaviour.

Pupils commented that poor quality and lack of equipment could influence their enjoyment of an activity. Further, it was associated with feelings of unrest in the class and pupils reported an association with feeling bored or uncomfortable as a result of poor equipment. Motl and colleagues (Motl et al, 2005; Motl et al., 2007), reported a positive relationship between access to equipment and PA, they also highlighted that this relationship was mediated by the personal correlate of barriers SE. Similarly, Sallis et al. (2001) identified an increase in PA in adolescent girls when improved equipment and adult supervision were provided. The current study also reported that participants felt their PA would be negatively impacted if the physical environment was not a suitable size and layout and was not clean, safe, and warm. Teachers have previously reported that insufficient facilities in terms of size, maintenance and cleanliness can discourage pupils from taking part in PE (Biddle, Coalter et al. 2005).

Another aspect of the physical environment which emerged in the current study was the prevalence of mirrors. Some pupils reported that having mirrors in their dance class provided pupils who were not taking part with greater opportunity to make negative comments. The American College of Sports Medicine, proposes that exercise environments are equipped with mirrors on at least 2 of 4 walls in an exercise setting so that individuals can monitor their technique. However, it has previously been shown that socially anxious females show an increase in anxiety in an exercise environment with mirrors (Raedeke, Focht & Scales, 2007). Whilst the current study did not examine this relationship, the provision of mirrors may have provided a further opportunity for negative comments to be made by some pupils about others and was thus sometimes viewed as a negative feature of the environment.

Suitable Timings

The results highlighted that having suitable timings for PE was an aspect of the physical environment some girls felt impacted on PA behaviour. Participants reported preferences for exercising at particular times, they also felt it was important not to be late to their next class as a consequence of PE. Most participants did not feel that an hour was a suitable length of time for a class, particularly as it could limit the types of activities open to them. Interestingly, neither school involved in the current study achieved the recommended two hours of PA a week (established through discussions with staff). The findings of the current study are in line with the PASS survey (2004) which reported ‘the majority’ of pupils receiving only 1 period of PE a week, despite current Scottish policy suggesting 2 hours and with Ferreira et al, (2006), who reported that most pupils do not receive enough PA in school. Further, for participants who were not active outside of PE, one period of PE a week was not perceived to be enough. This is in line with Inchley and colleagues (2010) who reported that 84% of Scottish secondary school girls would like to be more active. Given the reported positive correlation between days of PE per week and overall PA (Durant et al, 2009), the amount of PA adolescents are receiving in school appears particularly pertinent.

Despite the FFG report indicating that 73% of girls in their study had spent one and half hours or more in PE during the previous week, the number of girls participating in extra-curricular sport or PA that same week fell to just over 50% and 19% of girls reported that they had spent less than an hour in PA during their spare time (Inchley, 2010). The FFG findings along with those in the current study and the PASS survey (2008) have possible implications for the timing of PE in the future. Whilst there is support for using the school environment for increasing PA, it is suggested that consideration should be given to moving PE to out of school hours (3.30pm-5.30pm) on two days of the week in order to move girls closer to achieving the recommended levels of PA. Such considerations are beyond the scope of the current study, however, as participants report that they are not receiving enough PA through PE and that often PE is not meeting the UK guidelines, the possibility of lengthening the school day in order to meet policy guidelines is worthy of consideration. Further, ‘critical hours’ research conducted by Atkins and colleagues (2009), reported the 3 hours after school as ‘inactive time’ for the population of interest, and such findings require consideration for the potential re-scheduling of PE.

Suitable Changing facilities

Suitable changing facilities emerged as a factor participants perceived as influencing their PA behaviour. This is in line with the PASS report (2008) which highlighted changing facilities as an important feature of the physical environment in PE classes. It also supports findings of Biddle, Coalter et al. (2005) and O'Dea (2003). In the current study, participants identified several qualities they felt contributed to suitable changing facilities; creating privacy and making girls comfortable in their surrounding was important. However, the potential relationship between suitable changing facilities and PA behaviour was not clear. Several pupils reported that they were content to get changed quickly in order to take part in their class. However, others felt that the physical environment would benefit from having improved changing facilities. Anecdotal evidence from Fit for Girls (2008), suggested that improving changing rooms facilities could lead to an increase in PA. They recommended putting hair dryers and hair straighteners into changing rooms, however such suggestions were not proposed by pupils in the current study and therefore do not support the early evidence put forward by Fit for Girls. More recent evidence from FFG has indicated that 61% of girls felt that the facilities for sport and PA in their school are really good, but only 36% viewed the changing facilities the same way (Inchley et al., 2010).

Suitable Clothing

Participants perceived that suitable clothing for PE was a factor that influenced their PA behaviour and certain individual correlates of PA. It was suggested that clothing is a factor that can impact on some participant's comfort and confidence levels in PE. For others, it was not perceived as important. Some pupils reported they felt they were being judged by other pupils in their class as a consequence of their clothing for PE. Moreover, some pupils felt that their confidence was undermined depending on what other pupils were wearing. Overall, pupils felt that it was important to feel comfortable during PE; however, there was no consensus as to what the best attire for PE should be. The current study suggests that if pupils were amongst friends who wore similar clothing and if negative communication between pupils was reduced, the potential negative consequences associated with clothing during PE could be solved. This suggestion is in line with previous research which supports exercise delivery to friendship groups and individuals of a similar ability (Biddle, Colater et al., 2005; Springer et al., 2006; Davidson & Schmalz, 2006).

Weather

Adverse weather conditions were perceived by some pupils to have an impact on PA and motivation to be physically active. Previous literature has indicated that the weather can be a barrier to PA (Allison, Dwyer & Makin, 1999; Merrill, Shields, White & Duncie, 2005) and the current study supports this. Participants in the current study felt that it was important to have ample and suitable facilities in case of poor weather. However, as long as suitable indoor provisions were in place, this was perceived by adolescent girls as a suitable alternative for outdoor PA. However, given McKenzie et al's (2000, 2006) findings that outdoor lessons have higher levels of PA; this is something that requires careful consideration in the future.

General physical environment

The majority of participants reported that they perceived the social environment as more important than the physical environment in relation to PA. This is in line with Cohen et al. (2008), who reported that aspects of the overall school physical environment were not as influential in PA participation, as more social environmental factors. Nonetheless, participants in the current study felt that a suitable social environment would be ineffectual without appropriate physical environment factors. Whilst the importance of the physical environment is acknowledged, findings in the current study support Coalter and Dowers' (2006) recommendations that once the basic infrastructure for PA is in place, work should be focused around cultural and developmental issues, or, with this population, the social environment associated with PE. This is in line with McKenzie et al. (2000) who reported that when the basic provision of facilities and PA opportunities were present, more social aspects of the school environment influenced participation levels.

5.11 Social environment

The social environment emerged as the second main theme which adolescent girls in the current study perceived as influencing their PA behaviour. This theme contained the sub-themes; class composition, class climate and characteristics and behaviours of exercise leaders. Findings in the current study support previous research which associates several social environment factors with PA (Sallis, Prochaska and Taylor, 2000; Biddle et al, 2005).

The social environment has received much interest from PA researchers, however the literature review highlighted that the majority of this research was concentrated on social support. Social support did not emerge as a stand alone main theme or sub-theme, but was incorporated throughout the three sub-themes. It is not surprising that research has focused on this area because, as explained by Kuo and colleagues (2009), the social environment is often a consequence of the people involved and thus social support is a natural focus of investigation. In addition to social support, the current study yielded a vast quantity of data and it highlights several additional social environmental factors perceived as influencing PA behaviour.

5.11.1 Class composition

Tangible components of the social environment, which refer to the organisation of the class and the participants in it, were perceived as influencing adolescent girls' PA behaviour. Class composition emerged as an aspect of the social environment which adolescent girls perceive as influencing their PA. Second and third order themes which emerged from the data in relation to this theme, are now discussed in line with earlier research.

Friends in class

Social support did not emerge as a separate sub-theme; however, it primarily emerged in relation to peer support and leader support. Interestingly, parental support was not identified as an influencing social environmental factor in this study. This falls in line with previous research which has indicated that for older adolescent girls peer support is more influential than parental support in the case of PA (Whitehead et al. 2006; Inchley et al. 2008). However, it may have been that the focus group schedule was more focused towards the school environment and thus parental support was not as important as it may have been if the schedule was more directed towards out of school activity.

Participants reported having friends in their class, as a positive feature of the class composition. Pupils felt that having friends in their class helped them to enjoy PE more and reported that they felt more comfortable in PE when their friends were present. This reflects the findings of Taylor et al. (1999), who reported an association between fun and participating in sports with friends and family. Further, pupils felt that it was easier to communicate with others in their PE class when there were friends with them. Pupils

reported that they could 'be themselves' in PE when their friends were present. Conversely, when pupils were not with friends they reported that they could feel isolated and left out. This finding is line with the aforementioned research (Biddle, Coalter et al., 2008; King et al., 2008; Smith, 1999) which has highlighted a preference in adolescent girls for exercising with friends.

Findings in the current study reflect those of Biddle, Coalter et al., (2005) and Bungum and Vincent (1997), who both report a preference for exercising with friends amongst adolescent girls. The main source of peer social support reported was emotional support; making individuals feel comfortable in their exercise environment and encouraging each other. Pupils reported feeling comfortable when their friends were in their class compared to feelings of uneasiness and not being able to 'be myself' when they were in a class without their friends. Smith (1999) suggested that peer support contributes to the enjoyment of PA through providing companionship, recognising accomplishments and providing esteem support; each of these aspects were reflected in the current study. Moreover feeling embarrassed was cited by 36% of girls as a barrier to PA (Inchley et al., 2010) and thus being with friends may avoid such feelings. Ferreira et al., (2006) reported the existence of problems with (or teasing from) classmates in relation to adolescent PA could not be determined, but findings in the current study do not reflect this and suggest that negativity and 'bitchiness' from classmates may negatively influence PA.

Despite general support for having friends in PA class, several participants were happy to take part in a class in which there were only a few friends, rather than a class which comprised solely of friends only. This may go some way to explaining the aforementioned conflicting evidence related to peer support and PA levels (Biddle, Whitehead et al. 2005; Prochaska et al., 2002). Further, having friends in class was not always viewed as positive for PA behaviour, as some pupils reported that when they had friends in their class who did not share their PA interests, this could compromise their ability to fully commit to the class. This finding contradicts previous research which highlights peer support for adolescent girls as only a positive factor (Coalter, Biddle et al., 2005; Inchley et al, 2008). It could be suggested that as long as pupils exercise with those who share their PA interests and motivations the environment is appropriate. This is in line with FFG (2008) early findings that girls have preferences for exercising with others of a similar ability, weight and size.

Despite the identification of social support as a key influencing social environmental variable and the proposition that it promotes feelings of fun, enjoyment and comfort in adolescent girls, the mechanisms underlying social support, that is, the way in which social support actually functions are not clear. The current study did not seek to develop an understanding of this relationship, but further underlines the need for future studies to focus on understanding the way social support works, given the well documented influence on adolescent girls PA. Understanding the mechanisms behind social support would enable interventions to target this domain with greater specificity and potentially a greater impact (Cohen et al., 2000).

Participation levels

Participation levels in PE were perceived to influence PA behaviour, and personal correlates of PA. 'Everyone taking part' in the PA class was viewed as a positive feature of the class composition. Pupils reported that they were embarrassed and uncomfortable when they were watched by pupils who were sitting out. Pupils also reported frustration at the lack of effort by some others in their class. Pupils preferred a class where everyone was joining in, they reported this meant pupils could help and support each other. A sense that everyone in the class was 'getting into' the activity was also deemed important by the participants. This has previously been described as a 'cohesive environment' (Blanchard, Amiot, Perreault, Vallerant & Provencher, 2009) which has been associated with high levels of motivation in sport and educational settings (Lent, Schmidt & Schmidt, 2006).

Ability Levels

The ability level of class members emerged as a factor that participants felt influenced both PA behaviour and individual correlates of PA. Participants felt that working with mixed abilities provided an opportunity to work together and learn from each other and increased the fun aspect of the class. This finding, supports that of Smith (1999) who reported peer support as an important aspect of the exercise environment through recognizing accomplishment and providing esteem support.

It was reported that a mixed ability class could sometimes lead to negative communication between class members; being in a class that was mixed ability could sometimes make pupils feel out of place and awkward. This is not surprising given that in a previous study girls have reported lack of skill and embarrassment as barriers to PA

(Inchley et al., 2010). Several participants felt that a feeling of equality in the class was important and in a mixed ability class this was not always possible. Other pupils reported feeling uncomfortable when not exercising with others of the same ability level. Pupils reported feeling inadequate when they were in a class where they were not as capable as their peers. Competence has been identified as a correlate of PA (Biddle 2005a, 2005b), if an individual does not feel competent when exercising with others of a greater ability then it makes sense that this may influence their PA. Further, the findings in the current study reflect early FFG (2008) research which has shown a preference for girls to exercise with others of a similar ability level.

Size

The size of the PE class emerged as a factor associated with PA in the current study. Carron et al. (1990), reported that exercisers preferred either small or large classes. Whilst there were some methodological discrepancies in Carron's research the current study reflects this finding. In the current study, pupils felt that in smaller classes they received more teaching than in larger classes. However, they felt that larger classes could provide more opportunity for social interaction, but if a class was too big, pupils could feel self conscious. When asked to name their ideal size of class, most pupils felt that 20 was an ideal number, however it was apparent that the optimal size of the class was dependent on the activity pupils were taking part in and thus it is suggested, numbers per class should be considered in relation to the size of facilities, the quantity of equipment and the level of supervision required. In the current study, the size of the class raised concerns relating to appropriate supervision and this is discussed in more detail in the theme; 'characteristics and behaviours of exercise leaders.'

Sex

The gender of individuals present in a PE class was a factor that some participants felt influenced their PA behaviour and cognitions associated with PA. Participants reported feeling uncomfortable in the presence of boys in their PE environment, specifically during swimming. This is in line with an Australian study (James, 2000) which examined the composition of a class during swimming and reported feelings of discomfort in girls taking part in coeducational swimming classes.

In the current study, several girls also felt that the boys were too competitive and thus had a negative impact on their PA. This reflects previous research (Griffin, 1985) which

reported that girls could be harassed and intimidated in PE in the presence of boys. Similarly, Derry and Phillips (2004), highlighted a number of factors which supported single sex PE environments and these were in part reflected in the current study.

Previous research has highlighted that 37% of teenage girls in Scotland would prefer single sex PE classes (Inchley et al., 2010). It could be suggested that as with the size of class, having a mixed sex class was largely dependent on the activity that was taking place. Having boys present during PE had, for some pupils, implications relating to body awareness and competence. However, for other pupils and different activities, having boys present increased opportunities to learn from each other, especially when boys put more effort in. This could explain findings such as those presented by Homas et al. (2006) who reported greater energy expenditure and longer class length in co-educational classes. Overall, there appeared to be a number of psycho-social factors influencing the make-up of the class according to gender and further research examining this relationship in more detail is welcomed.

Choose Groups

Participants felt that the extent to which they had control over selecting the groups or teams in which they had to take part in a PE class with, had an impact on their PA behaviour and individual correlates of PA. Emergent themes highlighted that participants were concerned with fairness, control and equality in PE. It has been suggested that PE should support self regulated learners and more recently, Ryan and Deci's (2000) SDT has received increased attention in PA research. SDT examines behaviour in relation to intrinsic motivation and external regulation. SDT proposes that when the exerciser has an element of control, autonomy and self-regulation they are likely to be more successful. Findings in the current study go some way to supporting the enhancement of these factors in the PE environment.

Pupils reported that they were sometimes left out when either teachers or fellow classmates picked groups. As well as having an element of control over their PA, pupils are nervous about being left out during PE and this is a key reason why group selection issues arose. This links with previous findings which highlight that it is important for an individual to be competent, comfortable and have peer support in their PA environment.

Type of class

The type of class, in terms of a core PE class, versus a Standard Grade PE class emerged as a perceived influencing factor by the pupils. Participants who took part in Standard Grade PE perceived the class to have more unity than their core PE class. The underlying reasons for this may well lie in the discussion that follows under the heading class climate; this theme will discuss the ideas of a motivational climate and class cohesion. It is worth noting that as Standard Grade classes work towards an examinable curriculum, the manner in which it is taught is different to that of a core PE class, this coupled with the motivation and ability levels of those taking part as well as the frequency with which the class meets, are worthy of consideration of how this perceived sense of unity can be formed.

5.11.2 Class climate

Intangible aspects of the PE class emerged as social environment factors which participants perceived as influencing their PA levels. The climate of the class was perceived by adolescent girls in East Lothian and Edinburgh as influencing their PA behaviour. This is in line with previous research which indicated that the climate set for an exercise environment is extremely important as to whether an individual participates or not (Jess & Collins, 2003). Each of the second and third order themes of the sub-theme class climate is now discussed.

Supportive

This theme emerged as a third order theme under the main theme class climate. A key aspect of this theme was positive communication in the PE class. Pupils felt it was important not to be judged in their PE class, and a supportive environment helped them to feel more comfortable. A supportive atmosphere highlighted aspects of social support whereby pupils developed friendships and supported each other through PE, as proposed by Smith (1999).

This theme also highlighted a negative aspect of PE in the form of negative communication between pupils. The study yielded a lot of information relating to 'bitchy' behaviour between pupils during PE and the opportunity for 'shouting and moaning'. PE appears to be a more open forum for this type of behaviour to occur; pupils potentially have more opportunity to interact than they do in non practical subjects and this provides

certain individuals with more opportunities to communicate negatively with fellow classmates. Griffin (1985) reported that a coeducational PE class provided competent boys with more of an opportunity to intimidate and harass their female and less capable counterparts. Further, Derry (2004) reported that a coeducational class was less ineffectual for girls for a number of reasons. Whilst the findings in the current study are both gender and non-gender specific, it goes some way to supporting the findings of both Griffin and Derry.

Pupils enjoyed the feeling of being supported in their PA environment, by both peers and the exercise leader. This theme is linked with much of the discussion put forward in the class composition section. Peer support in this instance primarily relates to emotional support from peers and is consistent with previous research which highlights this as an important aspect of the social environment for adolescent girls (Beets et al., 2007; Motl et al., 2007).

Interactive

An environment that was perceived as interactive was something that participants enjoyed. Pupils reported enjoying PE as an opportunity for social interaction. It could therefore be suggested that PE as a platform for pupils to interact with each other, and to socialize should be encouraged if PA is to be promoted. If pupils don't mix with each other it is difficult for individuals to participate, and it is suggested that this is possibly why activities such as team building are popular; due to the focus on the interaction rather than the PA. Moreover, it is proposed that the nature of an activity such as team building enables pupils to have a level of autonomy, which has been linked to increased motivation (Reeve, Hagger, Chatizarantis, Culverhouse & Biddle, 2003, Black & Deci, 2000).

Competitive balance

Previous research has intimated that PA for adolescent girls should avoid competitive activities and only 26% of Scottish adolescent girls report that taking part in competitions is the focus of their PA pursuits (Inchley et al., 2010). However, this study would suggest that an element of competition was enjoyed by participants. This finding is in line with research which proposes the development of self regulated learners in PE (Trost, 2004; Fox et al., 2004) which proposes that if the level of competition is under the controlled of and monitored by an individual then it may enhance their motivation. Chapter 3

highlighted that self regulation can be enhanced through goal setting. Goal perspective theory (Roberts, 2001) proposes two forms of goals; task and ego. It has been suggested that task based goals are most appropriate for adolescent girls as it enables an element of competition without the emphasis on social comparison; the focus should be on what is important to each specific individual. Despite the suggestion that some competition is welcomed, it is suggested that an overly competitive environment is to be avoided as this tended to lead to feelings of uneasiness and can negatively influence feelings of competence participants. It has previously been highlighted that competence is a correlate of PA in adolescent girls (Biddle 2005a, 2005b) and thus, if levels of competence are low it is unlikely that girls will want to participate.

Positive atmosphere

In the current study, a positive atmosphere tended to lend itself to an enjoyable environment. Enjoyment has been highlighted as the main reason for participating in PA in Scottish adolescent girls (73%) aged 11-16 (Biddle, Coalter et al., 2005, Dishman, 2005) and it is therefore vital that activities offered in PE are ones that girls enjoy; therefore the opportunity to choose one's preferred activity for PE is suggested. The results illustrate that participants felt that both variety and the opportunity to choose an enjoyable activity were influential environmental factors as has been suggested by the FFG programme (2008). Whilst the activity being carried out is not the only contributing factor to enjoying an activity, it is a key one and thus requires careful consideration by exercise providers. Other factors such as peer involvement and perceived competence in an activity also play a role (Biddle, Coalter et al., 2005) and are discussed in more detail under separate sub-themes.

Findings in the current study highlighted that some pupils felt it was important not to be concerned about the potential consequences of not being 'good' at an activity. In line with the aforementioned goal perspectives theory and the Curriculum for Excellence, it is suggested that the focus should be on developing as an individual and where possible, developing competence in an activity, so that one can be self sufficient in it.

Opportunity to learn and opportunity to be less formal

An additional first order theme which emerged from the data reflected that participants reported that PE provided opportunities for both learning and social interaction. The

concept of PE being a sociable subject was reported by several participants. Recent research has indicated that adolescent girls enjoy 'sociable' PA and it could therefore be suggested that the sociable aspect of PA should be targeted in future interventions.

A further finding in the current study was that pupils were keen to learn and develop their PA skills. This contradicts common misconceptions that assume pupils are not interested in PA. Indeed the FFG study recently reported that 81% of adolescent girls reported that they enjoy PE 'a little or 'a lot', further, 27% of girls reported PE as their favourite lesson. It could be suggested that central to developing a creative learning atmosphere, is exploiting pupils views that, PE is an opportunity for pupils to be less formal, to 'have a laugh' and good fun with each other. Moreover, rather than PE being a source of stress for individuals, promoting it as a subject in which pupils can 'chill out' and not concentrate may be an appropriate way of encouraging PA. This supports practical guidelines proposed by Ntoumanis and Standage (2009) who suggest a focus on enhancing the autonomous aspects of PA; they suggest a teaching style which provides opportunities for choice and input, that teacher empathises with students' points of view and establishing peer-learning groups and support co-operation.

5.11.3 Characteristics and behaviours of exercise leaders

Characteristics and behaviours of exercise leaders emerged as a component of the social environment which adolescent girls perceived as influencing their PA levels. In the current study, 'exercise leader' refers to the PE teachers. The importance of the exercise leader in PA behaviour which was highlighted in the findings of the current study supports the finding of Luke and Sinclair (2001) and Barr-Anderson et al. (2008), who identified the role of the exercise leader as an important feature of an exercise class. Current findings also questions Ferreira et al.'s (2006) suggestion that role modeling and support from teachers were generally unrelated to adolescents' PA. The literature review highlighted that social support from exercise leaders was an area that required significantly more attention (Biddle & Mutrie, 2008). Given the wealth of information yielded in the current study in relation to exercise leaders' behaviour, this suggested is supported and further empirical research to examine the relationship in more detail is recommended.

The literature review also highlighted that class climate and exercise motivation could be set by the exercise leader. It is therefore unsurprising that some of the themes which

emerged in the theme ‘characteristics and behaviours of exercise leaders’ are related and over-lapping with those in the theme ‘class climate’.

Positive communicator

Positive communication from the exercise leader emerged as a positive behavior of PE teachers in the current study. This finding is in line with previous research which has identified the manner in which the exercise leader communicates with exercisers as influential on PA and correlates of PA (Glover, 1978; Nicholson, 2008). Moreover, in relation to PE, previous research has suggested that PE teachers communicate with pupils in a manner which empowers pupils and promotes autonomy in the exercise environment. The literature review identified that there has been a significant amount of research conducted in this area and supports the notion that communication from the exercise leader influences PA behaviour.

In particular, the communication enhanced in an ‘enriched leadership style’ (Fox, Rejeski & Gauvin, 2000; Bray et al., 2005) is supported by the findings in the current study. Further, Koka and Hein’s (2003) suggestion that intrinsic motivation is enhanced by teachers who promote positive and knowledgeable feedback and promote learning in a non-threatening and challenging environment is also supported. A further area related to teacher positive feedback is the term ‘competence supportive environment’, developed by Reeve (2002) to describe the optimal motivational climate for developing feelings of competence. It describes a number of teacher behaviours which are directly related to satisfying pupils’ feelings of competence during PE. He proposed that the interpersonal style of both instruction and feedback could enhance autonomous motivation, which is worthy of further examination.

Nicaise et al. (2007) reported that participants in his study had scored higher perceived competence, effort, enjoyment and PE final performance when they perceived praise from a teacher following a good performance; the findings in the current study are supportive of such behaviour from an exercise leader. The aforementioned interpersonal styles proposed by Ntoumanis and Standage (2009) which support students need satisfaction and autonomous forms of motivation is also given support in the current study. In particular, Ntoumanis and Standage’s proposal that teachers use language that promotes choice was recognized as a positive suggestion in the current study.

It has been reported that enjoyment has been identified as a key correlate of PA (Biddle 2005a, 2005b) and as such, it is unsurprising that pupils appreciate an exercise leader who is positive and good fun. In relation to competence, it could be suggested that a teacher who focuses on the positive aspects of the learning experience, rather than negative feedback aids pupils in developing their competence and thus their participation in PA.

In relation to role models, it has been suggested that PE teachers and health educators communicate important messages to pupils both consciously and unconsciously by both their actions and appearance (Glover, 1978). Findings in the current study support this notion especially in relation to the projection of a teacher having a positive, friendly and relaxed attitude. Further, Spencer (1998) indicated that teachers had a level of responsibility for promoting exercise in a positive or negative manner. It was reported that teachers could be positive role models by being competent, credible and responsible and by respecting students. In contrast, where teachers disciplined students with exercise or forced PA upon them, pupils were often discouraged from participating. Such findings are reflected in the current study.

There have been a series of studies investigating the effects of leadership style on exercise (Bray, Gyurcsik, Martin Ginis & Culos-Reed, 2004; Martin & Fox, 2001; Fox, Rejeski & Gauvin, 2000; Turner, Rejeski & Brawley, 1997). These studies focused around training exercise leaders in two forms of leadership style: socially supportive leadership and socially bland leadership. A socially supportive leader was characterized by showing interest in participants, being positive and encouraging through praise and verbal reinforcement and showing an interest through casual conversation before and after class. The socially bland leadership style criticised mistakes and did not encourage participants. They did not refer to participants by name or take an interest in them out of class. Results indicated that the socially supportive leadership style had very positive effects on psychological responses to exercise classes. Specifically, participants reported that it enhanced exercise SE, increased energy, enthusiasm and enjoyment, reduced post-exercise fatigue, lessened feelings of embarrassment and increased confidence in the capabilities of the leader. This finding is consistent with previous research that highlighted socially supportive exercise leaders (i.e., being positive etc) was associated with positive psychological responses (Bray et al., 2004; Koka & Hein, 2003; Fox et al., 2000). Findings in the current study highlight several features of a socially supportive leadership style as perceived as positively influencing PA in adolescent girls, whilst

aspects of a socially bland leadership style were reported as negatively influencing this group. Further examination of the influence of PE teacher's communication style on PA with such findings as a basis, is encouraged.

Stops negative behavior

Pupils in the current study reported that a teacher who prevented negative behaviour within the exercise environment was viewed positively. It has previously been reported that enjoyment is associated with PA in adolescent girls (Biddle et al., 2005a, 200b). An exercise class which is disrupted by negative behaviour is unlikely to be enjoyable and thus the teacher's role in preventing such behaviour is important (Bray et al., 2004). Further, it has previously been reported that a socially enriched university exercise class (which promotes a comfortable, relaxed and interactive environment) saw an increase in exercise adherence, compared to a class which lacked warmth and interaction (Bray et al., 2005). The current study goes some way to supporting this finding and suggests that the teacher plays an important role in creating an atmosphere for exercise which is enriched rather than bland.

Impartial and inclusive

A teacher who was impartial and inclusive was viewed favourably by pupils. It has been suggested that teachers support co-operation between class members in an exercise environment (Ntoumatis & Standage, 2009) and the finding in the current study supports this. A supportive group environment has also been positively associated with an increase in a number of psycho-social correlates of PA (Fox et al., 2000) and this can be enhanced through particular leadership styles. Accordingly a teacher who is impartial and inclusive is likely to encourage a more positive climate for exercise.

Understanding

An exercise leader who made sure participants were comfortable with the activity and understood the need to be with friends was reported as a positive characteristic of PE teachers. Previous literature has suggested that teachers use interpersonal styles which promote students needs satisfaction and autonomous forms of motivation (Ntoumanis & Standage, 2009) and the current study supports this. Pupils reported that they had a preference for a PA leader who did not make them do things they did not want to do. Glover (1978) reported that when a teacher forced pupils into exercising negative feelings they would be less likely to adhere, and the findings in the current study go some way to

supporting this. Further Ntoumanis and Standage (2009) and Mouratudis et al. (2008) suggest that when pupils display a negative interest in PE, teachers should use specific techniques to illustrate an understanding of pupils' points of view. The current study supports these recommendations.

Positive and good fun

Pupils were receptive of a teacher who conveyed positivity and was 'good fun' in class. It has been acknowledged that a teacher can influence pupils through actions and behaviours and (Franklin, 1986; Luke & Sinclair, 2001), and the finding that suggests a teacher with a more positive attitude and who creates a fun environment can positively influence PA participation.

Competitive Balance

A teacher who could establish the appropriate competitive balance within a class was viewed positively by participants. Pupils felt that when a class was too serious the element of fun and enjoyment was removed and this made them reluctant to participate. In line with the findings relating to the class climate, some pupils reported that an element of competition was important in helping them achieve their potential and for some, they felt they were more active when there was a competitive aspect to the class. In line with SDT, the results of the current study support the development of an environment which encourages autonomous learning with goals which are mastery focused (Theodosiou & Pappaionnou, 2006).

Supportive

Pupils in the current study felt it was important that they received public praise in PE because when praise was absent, pupils felt like their efforts had not been acknowledge. It has consistently been reported that teacher feedback can influence pupils' motivation to take part. Moreover, it has been suggested that feedback that is positive and knowledgeable and non-threatening yet challenging, will lead to an increase in intrinsic motivation, which will lead to an increase in adherence (Koka & Hein, 2003). The findings in the current study lend support to this notion. In line with Kulinna and Cothran (2003), the current study suggests that future research would do well to gain a deeper understanding of teaching practices to develop teaching practice and thus PA behaviour.

Friendly

Pupils reported that a level of familiarity and a form of friendship with their PE teacher was a positive attribute. It could be suggested that a sense of friendship between the exercise leader and pupils helps participants to feel comfortable within the exercise environment which may influence participation levels.

Competent and Participates

It was reported that pupils felt that a PE teacher who was competent was important. Similar findings have been reported in a sporting context, whereby athletes have reported a positive motivational climate as associated with coaches who effectively perform their roles of instruction and assessment (Keegan, 2009). This is also linked to research conducted by Glover (1978) who reported that PE teachers can influence pupils by their actions and appearance. In relation to participation, pupils prefer a teacher who takes part in the class rather than one who instructs from the 'sideline'. This finding also reflects that of Nicholson (2008) who reported that Scottish adolescent girls had a preference for female teachers who took part in activities. Research has also indicated that when PA is delivered by a specialist teachers, rather than generalist teacher, then the level of PA was higher (McKenzie, Stone et al., 2001). Pupils report a preference for a teacher who demonstrates competence and it could be suggested that this is also related to an increase in PA. Given the potential influence of role modeling and social and verbal persuasion from exercise leaders (Fox, 1997; Thompsons et al., 2003), it is important that individuals delivering PA are positive role models if they are to motivate pupils and help increase their efficacy for exercise.

Interested

Much PA research has pointed towards creating a sense of autonomy in the exerciser. Exercisers should have a sense of accomplishment and personal control in their exercise and this was reflected in the findings of the current study. Results indicated that pupils preferred a teacher who showed an interest in an individual and their personal PA needs. Understanding and appreciating the needs of pupils can potentially influence feelings of comfort in the exercise environment.

Awareness

Pupils in the current study felt it was important for their teachers to have an awareness of what is going on in the class. Pupils felt this was particularly important in relation to behavioural issues.

Additional themes

In addition to the key characteristics and behaviours of exercise leaders which have been discussed, pupils reported on a number of additional first order themes (which were unrelated to second order themes previously presented) which could influence their PA behaviour.

Good hygiene

As was previously reported, Glover (1978) suggested that PE teachers can influence pupils by their appearance and actions. Pupils in the current study reported a preference for PE teachers to have good hygiene as this could have an influence on their motivation to participate.

Doesn't make you do things you don't want to do

It has previously been outlined that forcing a pupils into participating in PA has negative implications for their adherence (Glover, 1978). This was supported in the findings of the current study. Again, the findings of the current study, support the development of an autonomous environment and an exercise leader who displays empathy

Gender

Findings in relation to gender were mixed, some pupils reported that they were eager to impress or please a male teacher. Other pupils reported a preference for a female exercise leader, which is supportive of Nicholson's (2008) findings in Scottish School girls. For other pupils, the gender of the PE teacher was not important and it could be suggested that if other characteristics and behaviours were displayed (i.e. sense of fairness, interest) then the gender of the teacher may not be as important. Indeed only 35% of girls in the FFG study reported a preference for a female PE teacher (Inchley et al., 2010).

Age

Pupils felt that younger teachers were more effective at encouraging and motivating than their elder counterparts. It could be suggested, that as with gender, if an exercise leader shows an understanding of individual needs then their age is not actually the important characteristic, but further research examining this relationship is required.

5.12 Limitations of study

It can be seen that there are a vast number of factors perceived by participants as influencing their PA levels and it should be acknowledged that increasing the population sample to other regions of Scotland may have yielded additional factors of interest. Nonetheless, this study has produced a starting point from which future research can be based.

Much environmental research has sought to identify and measure environments for PA (Smiley & Roux, 2004, Giles-Corti, 2006), but has not aimed to assess the psychological and behavioural impacts of these environments. It could be suggested that this is a result of the complex nature of addressing health issues from a structural and social perspective (Smedley, 2000). Nonetheless, there is now an increased emphasis on the role of the social and physical environment as key correlates of PA and personal factors associated with PA (McNeill, et al., 2006). Whilst there has been an increase in environmentally focussed research, it has tended to ignore the intrapersonal and interpersonal impact of the physical environment (Giles-Corti, 2006). Despite an acknowledgement in the current thesis of a relationship between the environment, individual correlates of PA, and PA behaviour, the current study did not examine the intra- and interpersonal impact of the environment. However, that was not an explicit aim of the current study ; it could be suggested that key environmental aspects perceived as influencing PA behaviour in this population needed to be identified before the examination of reciprocal relationships can be.

5.13 Conclusion

SCT proposes a triadic relationship between the environment, individual factors and behavior (Bandura, 1986). The current study has highlighted specific environmental factors that adolescent girls perceive as influencing their PA behaviour. The current study not only goes some way to highlighting the critical role that the environment plays on influencing PA, but also strengthens the suggestion of a relationship between all three components of the SCT model. It is thus thought appropriate for providing further support for SCT as an appropriate model for understanding PA behaviour and for developing PA interventions. Nonetheless, it should be acknowledged that the current study did not seek to test this relationship or the model, but to highlight the potential relationship for future research.

The large quantity of information presented in the current chapter highlights that there are a number of different opinions as to which aspects of the environment is perceived to

influence PA behaviour; what one girls perceives as important, may not be for another and vice versa. Nonetheless, the study supports previous research which has identified the environment as an important feature of the PA environment. It has advanced upon this research and has made it specific to adolescent girls and the school environment within a localized area of Scotland. In relation to the social environment, a wealth of information was yielded in the current study and much of it supports previous research in this area.

Consideration of both the physical and social environment will be given during the development of the final intervention and is discussed in more detail in Chapter 7.

CHAPTER 6: ADOLESCENT GIRLS' EXPERIENCES OF A SMALL SCALE ACTIVE - GAMING INTERVENTION

6.1 Introduction

Previous chapters highlighted that correlates associated with PA in adolescent girls are multiple, complex and varied. SCT suggests that PA determinants can be categorised across; behavioural, environmental (e.g. physical, social), and personal (e.g. SE, competence) domains and that each of these areas is interrelated and interdependent in influencing behaviour change (Bandura, 1986). Chapter 1 highlighted active-gaming, a relatively novel form of activity which has been associated with enjoyment, as a potential means of increasing PA and psycho-social correlates of PA in adolescent girls. It is proposed that in order for an active-gaming intervention to be successful, it would do well to target each of the SCT variables in order to avoid being a short term gimmick. Previous chapters introduced the personal and environmental correlates of the model that may be considered when developing the final intervention in the current thesis. The current chapter seeks to target the behavioural component of the SCT model by using focus groups to examine the experiences of girls who participated in 6 weeks of active-gaming as an activity choice in PE. The findings from the current study are considered for the development of a larger-scale active-gaming intervention presented in Chapter 7.

6.2 Background to current study

Chapter 1 provided an over-view of current active-gaming research. It was highlighted that there has been limited psychological research conducted in relation to active-gaming, with only one published study in this area (Cummings & Duncan, 2010). It was also recommended that before embarking on a large scale active-gaming project, a pilot study is conducted to assess the feasibility of implementing such an intervention (Maddison et al., 2009).

The teenactive research group (www.teenactive.org) ran a pilot project that aimed to explore the potential effectiveness of a multi-player dance system in schools and communities to improve aspects of health in low active adolescent girls. The study was completed in a secondary school in Edinburgh, and involved two phases of data collection. Phase 1 aimed to assess the physiological response to playing on a multi-player dance game, whilst phase 2 aimed to explore the potential health benefits of 6

weeks of game play in place of regular PE. Phase 1 of the study identified that adolescent girls who play the game will achieve an intensity of activity sufficient to contribute to daily PA requirements, even when playing at the most simple of difficulty levels (Fawkner, Niven, Thin, MacDonald & Oakes, 2010). Phase 2 of the study suggested that regular game play did not demonstrate measurable benefits. It should be noted that, the pilot study was not carried out as part of the current thesis; however a synopsis of the study is available (Fawkner, et al, 2010).

In addition to the explicit aims of the project outlined above, the intervention also provided an opportunity to explore experiences of the girls who took part in the study, in order to inform and develop the final intervention presented in the current thesis (Chapter 7). This was conducted through two focus groups.

6.3 Methodology

6.3.1 Participants

At the end of the small-scale intervention, the girls (aged 14) who participated in the six week active-gaming intervention were invited to take part in a focus group session to explore their experiences of the project. There were two focus groups with four participants in each.

6.3.2 Measurement

The purpose of the focus group was to examine the positive and negative experiences of the intervention, with a view to informing a larger scale active-gaming intervention. A focus group schedule was designed to promote discussion on the girls' experiences of the intervention (e.g., barriers to participation, perceived benefits). The schedule was underpinned by SCT encouraging discussion across environmental, personal and behavioural factors (Appendix L). Discussion with those who delivered the intervention also guided the schedule development in order to analyse participants' experiences of the intervention with the aim of developing future active-gaming interventions. The schedule was used as a guide rather than to direct discussion. Broad open-ended questions were used in order to promote as much discussion as possible and to retrieve as much data as possible. Further, probes and materials such as paper and pens were used for specific exercises and PA quotes were used in order to encourage participation and to stimulate discussion.

6.3.3 Procedure

Before each focus group, the girls were reminded that they did not have to participate and that they were free to withdraw at anytime. Each focus group was carried out in the school environment, at a time that was suitable for the school. A working agreement between the participants and researcher was developed immediately before the focus group discussion began. As with the focus groups conducted in Study 2, the researcher was trained in focus group moderation and utilised the necessary skills to the best of her ability to ensure that participants felt comfortable at all times. The two focus groups lasted 42.42 minutes and 50.13 minutes respectively.

6.3.4 Data analysis

Data was transcribed verbatim; a sample transcript is available as an appendix (Appendix M). Data were organised into positive and negative aspects of the intervention. After data organisation, inductive content analysis was undertaken to identify common themes relating to the experiences of the intervention, this follows the inductive content analysis procedures highlighted in Chapter 5 (pp133-135).

6.4 Results

6.4.1 Overview

This study examined the experiences of participants taking part in an active-gaming intervention with the aim of identifying positive and negative components in order to inform a future intervention. Each theme is presented by both text and diagrams and in line with Study 2, the diagrams are hierarchical in nature and follow the key detailed in figure 6.1. The same data analysis processes described in Study 2 were employed in the current study, whereby meaning units were identified and data was organised prior to inductive content analysis. The steps taken to increase the trustworthiness of the data in Study 2 (pp.136-137) were reflected in the current study. Similarly, quotes are used to provide further meaning to each of the themes and to bring them ‘to life’ and pseudonyms are used in place of the participants’ real names.

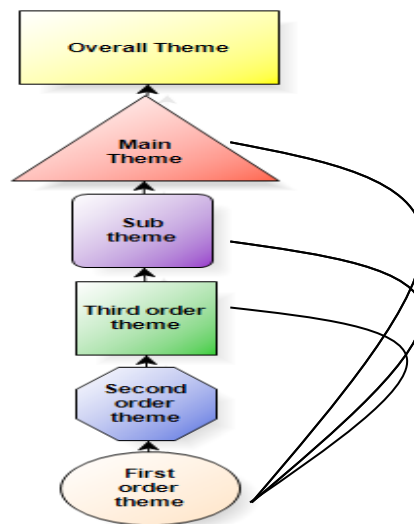


Figure 6.1: Diagram Key – Development of Themes.

Each theme identified is proposed as a factor that influenced the pupils’ experience of the active-gaming intervention. For this reason any information emerging from the data that did not inform a future intervention was not included. The focus group schedule anticipated that a different theme ‘improvements to the intervention’ would emerge. However, in nearly all cases suggested improvements were allocated as either positive or negative aspects of the intervention and a separate stand alone theme did not emerge.

Figure 6.2 illustrates that the data were organised into two main themes; positive and negative aspects of the intervention. In line with SCT, each of these themes yielded 2 subthemes: environmental factors and individual factors.

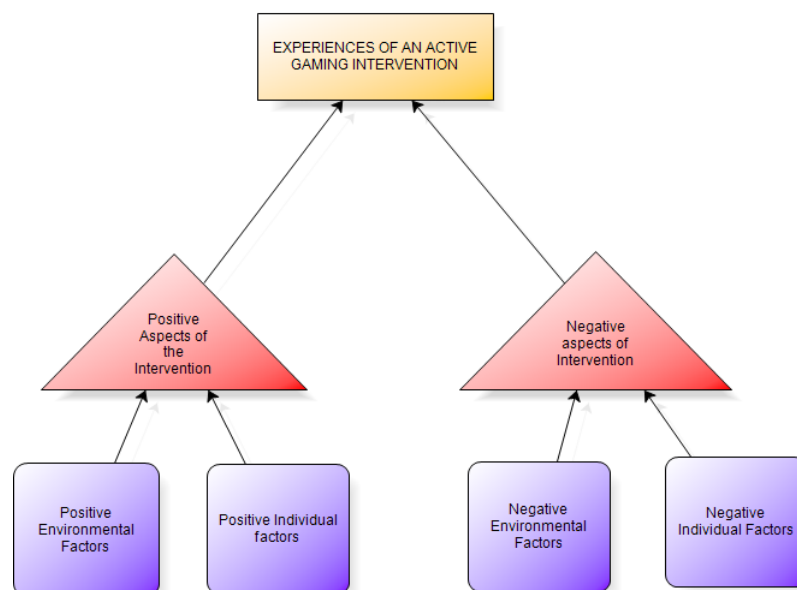


Figure 6.2: Participant experiences of an active-gaming intervention.

6.4.2 Main theme: Positive aspects of the intervention

The theme ‘positive aspects of the intervention’ was defined as any reference to the intervention that was deemed positive by the primary and secondary researcher. This theme also included comments relating to positive contributions to informing the future intervention. The results presented are the collective responses of both focus groups conducted. A total of 156 meaning units were allocated to the theme; ‘positive aspects of the intervention’. The results are presented in diagrammatic format according to the themes identified. Figure 6.3 provides an overview of the themes emerging under the general theme; ‘positive aspects of the intervention’ and it illustrates that there were 16 first order themes, 2 second order themes, 2 third order themes and 2 sub-themes. The diagram is hierarchical in nature and there were occasions where first order themes were directly related to the overall sub-theme.

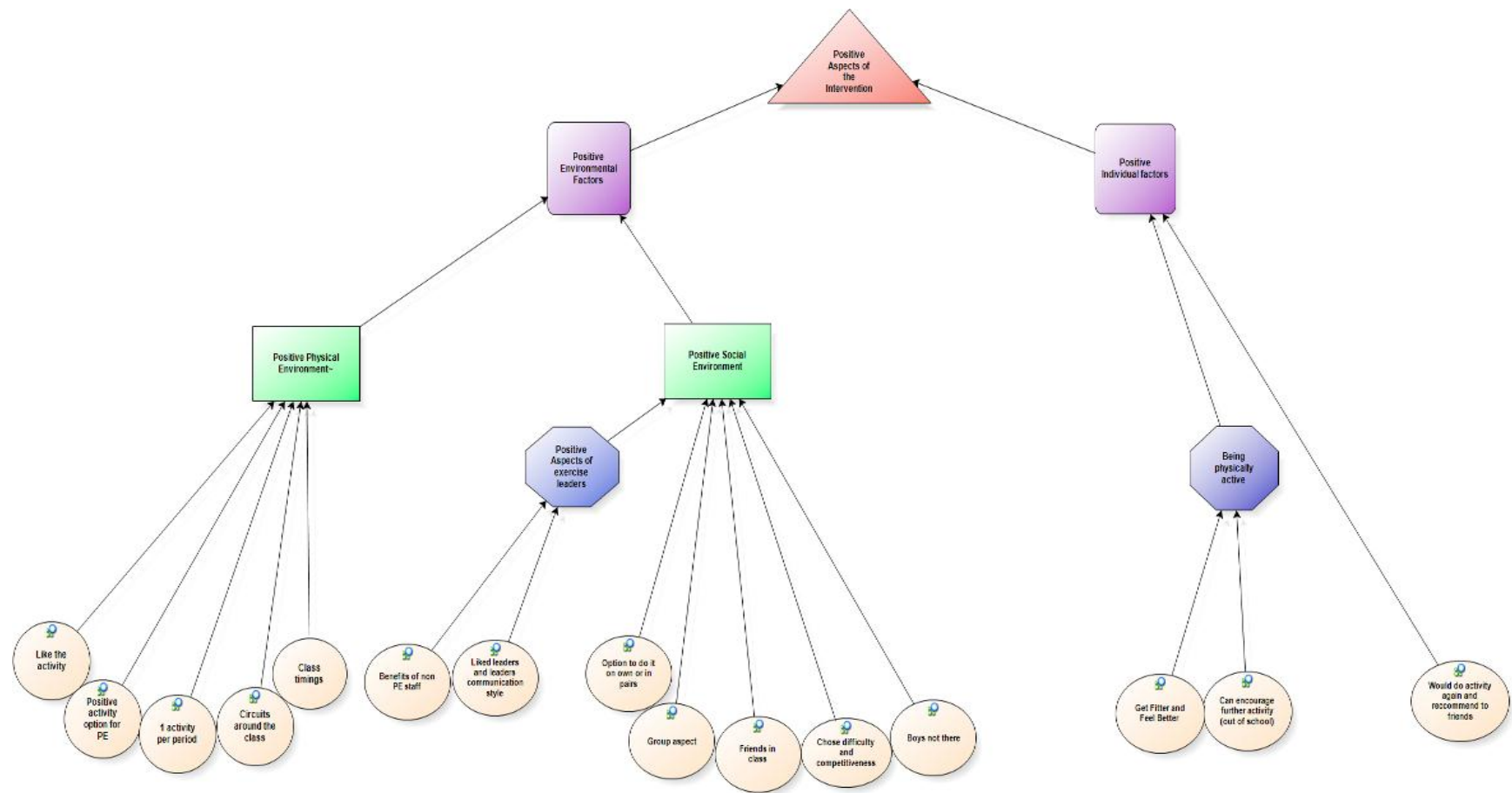


Figure 6.3: Main theme: Positive aspects of the intervention

Sub-Theme: Positive environmental factors

This theme incorporated all suggestions related to positive comments regarding the physical and social environment. Figure 6.3 illustrates the emergence of 12 first order themes and 1 second order theme into the sub-theme; Positive Environmental Factors.

Hierarchical structure of third order theme: Positive physical environment

The physical environment definition follows that used in study 2: ‘material objects and facilities present in an environment’ (Humpel, Owen and Leslie, 2002). As with Study 2, this included references to the actual activity. There were four first order themes that merge into the third order theme positive physical environment.

Like the activity

This theme contained meaning units that made a positive reference to the dance mats provided for the intervention. The majority of the girls reported that they enjoyed the intervention and the girls in Focus Group 1 explain why:

Erin: eehhh! Yeah Its better than P.E. like its funner and you can actually do something you enjoy but in P.E. you have to do what they tell well in fact you have do what they tell you in this as well.

Chloe: It was good fun instead of PE, cos PE’s quite...it’s like a sentence....it’s draining cos you don’t get a choice of what you want to do.

Arlena: Like fitness, oh my god.

Kelly: But like the dance mats were good fun.

It can be seen that the actual activity provided in the intervention was generally well received by participants and was reported as fun.

Positive activity option for PE

As well as reports that participants liked the activity there was also a positive response to having active-gaming as an option for PE. In turn the theme ‘positive option for PE’ emerged and it incorporated comments of participants relating to active-gaming as a positive option for PE or a preference for active-gaming over more traditional PE subjects. Sophie and Chloe reported that they would rather do active-gaming for PE than the other activities on offer to them:

Sophie: I would rather do that instead of P.E. as well

Chloe: yeah cause it like a change from what you are doing in class

One activity per period

This theme emerged from meaning units that suggest participants would like to do a specific activity gaming activity for one period rather than a variety of active-gaming options as a circuit's session, as demonstrated by May: "I would like to do it weekly so then we have a whole hour in one thing."

Circuits around the class

In contrast to the previous theme, some participants identified that they would like to use the active-games as 'circuits' round the class so they could switch between activities throughout the lesson. Jasmine thought this was a positive option: "I think it would be good if in the room you could switch between them, you could do some time on the dance mat and some time on the eye toy and that."

Class timings

This theme emerged from pupils comments about the timings of the intervention and the suggestion of an afterschool or lunch time active-gaming club. Some pupils such as Arlena and Cherlyn felt enthusiastic about having an extra-curricular active-gaming class:

Arlena: No so like they could go play it after school

Researcher: instead do you think it would be a popular after school club

Cherlyn: Yeah yeah I would

Researcher: Would you recommend it to all your friends?

Arlena: yeah

For these pupils, having active-gaming opportunities outside of PE time was a positive idea.

Hierarchical structure of third order theme: Positive social environment

The social environment is defined as; 'the organisation and make up of participants and intangible aspects of the social environment of the intervention'. Figure 6.3 illustrates that

were 8 first order themes and 1 emergent second order theme that emerge into the third order theme Positive Social Environment. There were no third order themes and one first order theme did not develop into a second order theme, but emerged directly to the overall sub-theme class composition.

Positive aspects of exercise leaders

This theme emerged from participants' comments describing any positive characteristics and behaviours associated with the exercise leaders delivering the intervention.

Benefits of non PE staff

Some pupils, such as Cherlyn, felt that having non PE Staff run the intervention was beneficial: "Cause the people who like run it are like more like.... the teachers are bossier than them....dinnae tell you what to dae as much." Cherlyn reported that she felt this was a positive attribute of the exercise leaders. Erin also reported that she thought there was value in having non-PE staff deliver the intervention:

If you sit and talk to you like and got really friendly like and I would I was like listening to them have like listened to them I we could all do this together and that but if they were if they were like a teacher then it would just make me nae want to do it because it's just like another class and that.

The delivery of the intervention by non PE staff made the experience of the intervention different to normal PE, something that Erin thought was positive.

Liked leaders and leaders communication style

This theme refers to participants' comments that they liked the exercise leaders and the style of communication adopted by them. This was described by Chloe: "They were kind and they spoke to you in a nice way."

Additional first order themes relating directly to positive social environment

This refers to first order themes which relate to the positive aspects of the social environment in the intervention.

Option to individualise or take part in pairs

Pupils reported that they enjoyed the option to work individually or in pairs during the intervention and not necessarily as a whole class. Kelly and May discussed the benefits of working alone or in a pair:

Kelly: There was two people trying to do some at the back and some at the front and that was more fun

Researcher: That you can make it individualized..?

Kelly: Yeah cos Andrea was really good at it and she was away up on the hard one

May: I was on the easy one

The option to have different numbers involved in the intervention depending on the set up of the class was something some pupils appreciated.

Group aspect

This theme relates to participants comments showing a preference for the intervention to be in group, rather than on an individual basis, as demonstrated by Arlena: “I preferred doing it with a group of people rather than on my own.” This is in contrast to the earlier quotes of Kelly and May who enjoyed the option to do the activity by themselves.

Friends in class

Participants felt it was beneficial to have friends in their class; this theme was developed from meaning units that stressed the benefits, or positive impact of friends being present in the same PA class. Erin explained that she felt it was more fun to take part in the intervention with friends than on her own: “I done it on my own cause I had to like, I got picked to do the experiment thing with the mask and stuff...but it was more fun like with my friends and stuff.” Similarly, when pupils were asked to report on the aspects of the intervention, they enjoyed the majority reported ‘being with friends’.

Chose difficulty and competitiveness

This theme emerged when participants made reference to the difficulty level, and competitiveness of the activity on offer. Some pupils, such as Chloe, felt that it was beneficial to be able to choose her difficulty level on the dance mats:

Yeah I liked that cause if easy the easy one was too easy then I wouldn't move onto the medium and if I wanted like to step it up then I could go hard and if I still thought it was hard then I would just go back down.

Kelly reported that she enjoyed keeping a score on her dance mat in order to add a competitive element to the activity: "I've got that as well it's good that there is scores cause then it's like cause if its jus dancing then it's not really something but at least that something its kinda competitive."

Pupils viewed both the opportunity to opt into a competitive form of active-gaming and the ability to set your own difficulty level as positive aspects of the intervention.

Boys not there

This theme emerged from participants comments relating to the absence of boys in the intervention class. Cherlyn and Jasmine discussed why they felt the class was better without boys in it:

Cherlyn: so it's like all the laddies, the laddies they just like would just take the biscuit out of it

Jasmine: they would just like smash it

Researcher: so it was good, it was good to have it just girls only?

Cherlyn: yeah

Jasmine: Yeah

The majority of girls enjoyed doing the active-gaming intervention as a single sex class and the above quote illustrates that the participants felt that the boys might have mocked the intervention.

Hierarchical Structure of third order theme: Positive individual factors

This theme refers to comments that emerged relating to individual factors associated with PA behaviour as outlined by SCT.

Being physically active

This theme emerged from participants' references to active-gaming as a good opportunity to be physically active, and some of the perceived benefits of being physically active.

Gets you fit and active and you feel better

Some participants perceived that they felt better after an active-gaming session and that they recognised the physical benefits of taking part in PA of this nature. This was discussed by Erin and Cherlyn:

Researcher: right ok is there any benefits do you feel better after you have done it?

Erin: You feel fitter

Cherlyn: You feel like you have let something out

Erin: You know when you die like and you let out all your bad bits

Further, Jasmine reported that when she was taking part in active-gaming she didn't feel like she was really 'exercising': "When you are doing them it dinnae feel like you are doing exercise you just feel like you are having fun." This was something that Jasmine felt was a positive experience for her.

Can encourage further activity (out of school)

Some participants reported that taking part in the intervention motivated them to take part more PA out of school, this was described by Annabelle: "If we were doing it school then I would be like oh yeah I like that I want to do that then I would want to go home and do it."

Additional first order theme

This theme did not develop into a second or third order theme, but linked directly to the theme positive individual factors.

Motivated to do activity again and recommend to friends

This theme emerged in relation to participant's comments that they would take part in the intervention again or would recommend the intervention to others. In general, there were positive comments relating to the continuation of the intervention and active-gaming as an option for PE:

Cherlyn: It's a good idea I think you should keep it going.

Researcher: And would it be something that you would recommend to your friends...?

Group Response: Yeah (all)

6.4.3 Main Theme: Negative aspects of the intervention

This theme refers to comments that emerged in relation to the negative aspects of the intervention. There were a total of 164 meaning units allocated to negative aspects of the intervention, of these 63 meaning units referred to a lack of choice. Figure 6.4 illustrates that this theme yielded 19 first order themes, 3 second order themes, 2 third order themes and 2 subthemes.

Sub-theme: Negative Environmental factors

As with the positive aspects of the intervention, comments relating to both the physical and social environment emerged from the data. However, in this instance the themes refer to any negative comment made in relation to the environment.

Hierarchical structure of third order theme: Negative physical environment

This theme refers to any negative comments made by participants in relation to the physical environment (as was previously defined). Figure 6.4 illustrates the emergence of 2 first order themes into the theme choice of music and programmes, 3 first order themes into the second order theme no organised breaks and 2 first order themes linked directly to the third order theme.

Hierarchical structure of second order theme: Lack of choice and variety

This theme is defined as any comments relating to the participants' views that there should have been more choice and variety in the active-gaming sessions in relation to a number of factors.

Lack of music choices

This theme emerged when pupils passed comment on the music assigned to the dance mats. All pupils reported that they did not like the music that was assigned to the dance-mats and would rather have their own choice of music playing whilst participating this is demonstrated by Cherlyn, Arlena and Nicole:

Researcher: What type of music would you have liked instead?

Cherlyn: Music that you actually like and recognize.

Arlena: There was a song that I recognised it was really old, radio killed the radio star or something and it was sung by this cartoon person.

Nicole: Yeah it was changed and it was mingin'

In order to cater for all musical tastes in the class Jasmine proposed a suggestion box: "We could have a box and everyone put your suggestions in the box and then put all the

songs onto the iPod and then we could all have a song we like and at least we get an opportunity to listen to other music as well.”

Lack of choice of games, programmes and consoles

This theme emerged when participants made reference to the availability of choice relating to games, programmes and consoles on offer. In general, participants thought that there was a lack of choice associated with the dance-mat intervention and would prefer an active-gaming option that provided more choice as illustrated by Andrea and Sophie:

Andrea: Oh yeah, you get like more games you don't have to stay on the same thing.

Sophie: and then you can do the Wii sports, dancing Mario cars and fit and stuff

As an active-gaming intervention the current study only provided dance-mats and pupils felt that having Nintendo-wiis and eye-toys may have improved the quality of the intervention. Further, pupils went on to discuss the different games they could play on these consoles.

No organised breaks

This second order theme referred to the views of some participants that the intervention needed some rests scheduled in to the class and that water during these breaks would be beneficial.

Didn't provide water

This theme emerged when some pupils felt that the researchers should have provided water for during the class, as suggested by Laura: “they should have had like cups of water for us.” When probing pupils further it transpired that they were not provided with water in their normal PE class and perhaps could have brought their own water bottle in order to combat this problem.

No rota and organised breaks

This theme emerged from participants' references to a lack of organised breaks and the fact there was no rota in place for pupils to take turns on the dance mats. Avril and Michaela felt that a rota was important:

Avril: You should have a rota.

Michaela: Yeah, you should do it in 2 groups and like make people go on for 10 minutes or something and then come off while the other group go on, so you get a break and you're doing it as well.

Some pupils felt that staying on the dance mats for the whole period of PE was not appropriate, and that to overcome this, the researchers should have scheduled in breaks and made sure everyone was on the dance-mats for equal amounts of time.

No breakout area

Some pupils proposed that when they were taking a break whilst off the dance mat a breakout area would have been appropriate. This was demonstrated by participants such as May: "Then have a resting area like couches and bean bags." This is not something pupils have during a normal PE session.

Additional first order themes

Figure 6.4 demonstrates that these three themes did not develop into second or third order themes, but evolved directly into the overall theme negative physical environment.

Room too small and stuffy

The intervention took place in a dedicated room, but not a traditional room for PA. Feedback from pupils indicated that some of them would have preferred a bigger room with better ventilation:

Eleanor: I think that the room is a bit (cleared her throat) was a bit too small and all the dance mats are like in front of each other

Shona: A more ventilated room cos it was really hot and stuffy in the room

For a larger scale intervention, it would be appropriate to try and deliver such an intervention in a larger room and one which has appropriate ventilation for PA.

Didn't like activity

This theme refers to participant's comments that they did not enjoy the activity on offer, such as Sarah: "I like Nintendo Wii, but I don't really enjoy dance mats'. For a participant such as Sarah, the form of active-gaming was not to her liking, but an alternative form of active-gaming would have been more appropriate.

Layout and quantity of mats and screen

Pupils made comments about the layout of the mats and the screen. Many pupils, such as Chloe, felt that the design of the mats provided for the current study were different to those provided in games arcades:

The only thing I didn't like about the dance mats was they are not like the normal ones they are like corner, corner and then in the middle and the ones in like if get to the arcade and that I am used to doing like.

Some pupils felt that they would get use to the new layout of the mats, but there were also concerns about the screen. For example Annabel stated:

Annabel: There's not like a proper board for the screen, it just goes on the wall and you couldn't see it properly

Poor class timings

This theme referred to the timings of the intervention and was related to discussion about delivering the class as an after school or lunch time club. Whilst some pupils thought this was a positive idea, other pupils were not so positive about this possibility. Erin and Kelly discussed possible reasons an after school club might not be successful:

Erin: Better stuff to do

Researcher: Such as?

Kelly: Sleeping or

Researcher: Chilling out?

Jamsine: Just going home and just sitting

Some pupils felt that pupils would not attend an after school club as they would be taking part in other more sedentary activities.

Class numbers

The theme class numbers was defined as referring to the number of people present in a PA class. The class numbers for the intervention were discussed by some of the pupils:

Researcher: And then others joined in and did it go up to 13/14

Kelly: Yeah

Chloe: Yeah

Researcher: Did that seem too many

Jasmine: Yeah, there weren't enough dance mats

Erin: It seemed too many cos it was just the dance mats, I think if you had other stuff it would be alright

The pupils report that having numbers of 13 or 14 were too many as there was not enough equipment. Whilst an optimal number for active-gaming is not proposed by the pupils, it is apparent that not having too many people for the equipment provided is important to enhance the experience.

Hierarchical Structure of third order theme: Negative social environment

This theme is defined as any comments relating to the participants' negative perceptions of the social environment in which the intervention was conducted.

Negative aspects of exercise leaders

This theme emerged in relation to any negative comments pupils made about the characteristics or behaviours of the individual leading the active-gaming intervention.

Leaders were moany

This theme referred to negative communication in the form of shouting or moaning at pupils. May expressed her views on the exercise leaders: "We didn't like them. We thought that they were too moany and they like push you to go on it if you wanted like a 5 minute break." In general, pupils did not respond well when the exercise leaders asked pupils to stay on the dance mats rather than taking time out.

Leaders didn't encourage and join in

This theme made reference to pupils' perceptions that the exercise leaders did not encourage them and that they didn't participate with them. This was illustrated in the interaction between Erin, Chloe and Arlena:

Erin: They weren't that involved in it really

Chloe: It would be more fun if they were on it as well cos then you could like have...

Arlena: They just kind of like stood there and every 5 minutes they just like just be like get on then and there were quite a lot of people who just said no and they just walked away and did nothing about it

This illustrates that some pupils would have liked the exercise leaders to have taken a turn on the dance-mats with them and felt that the exercise-leaders were just standing about. Cherlyn also felt that by standing around the exercise leaders were not encouraging: "They were friendly but it just like they didn't really they just stood there like didn't encourage or that."

Felt leaders were intimidated by pupils

Some participants felt that the exercise leaders were intimidated by some of the pupils in the class, one pupil states: "I think they felt intimidated."

Leaders not aware of everything going on

Some participants felt that the exercise-leaders were not aware of everything going on in the class in relation to people taking turns on the dance-mats and unmotivated pupils being in the class. This was explained by Annabel: "Yeah, cos they weren't really watching who was going on and then when you came off they were like you have to go on, you have to go on, even though you'd been on." Pupils felt that the unmotivated pupils went un-noticed by the exercise leaders: "But they were just ignoring the people who were sitting there doing nothing."

Additional first order themes

Not on offer to everyone

It emerged that some pupils felt that the active-gaming intervention should be on offer to everyone, not just S3 girls. For example, May felt it that the intervention should be available to all: “For boys and girls of all ages make everybody welcome.” This illustrates that not all pupils felt that the intervention should have been targeted at girls only and that some participants would like boys in the class.

No rewards for taking part

Some pupils felt that there was a lack of incentive for taking part in the intervention and Cherlyn felt that having a reward may have increased her motivation:

Researcher: So what would encourage you to not sit out?

Cherlyn: Biscuits in front of em

Chloe: Yeah (giggles)

Cherlyn: I don’t know. Not to sit out if there were like prizes.

Cherlyn felt that if there had been prizes on offer to those taking part then people would have avoided sitting out. Similarly Arlena thought that the person who got the highest score on the dance mat could win a prize: “Well somebody with the highest score could get something.”

Unmotivated pupils in class

This theme was defined as having a class where some pupils sit out and do not participate. It emerged from participants’ references to people in their class not taking part in the PA class. Jasmine, May and Sophie described why they thought some pupils were not motivated to take part: #

Researcher: And why did so many people sit out do you think..?

Nicole: Cos they’re so bothered about their hair and make up and listening to their i-pods rather than the tutors.

Andrea and Arlena describe the impact she felt that having unmotivated pupils in her class had on the PA class:

Researcher: Do you think that kind of took the attention of the girls who were taking it away from you guys, cos they were trying to deal with the people who weren't doing it?

Andrea: Yeah, cos they weren't really watching who was going on and then when you came of they were like you have to go on, you have to go on, even though you'd been on.

Arlena: But they were just ignoring the people who were sitting there doing nothing.

Cherlyn and Nicole discussed why some unmotivated pupils came to the class:

Cherlyn: Cos people were probably spreading the word that it was a skive...

Researcher: And did you think it was a skive.

Nicole: For the people just sitting there...

Cherlyn: ...doing their make up.

There were several unmotivated pupils in the class, and it appears that these pupils were more pre-occupied with 'doing their make up' than taking part in the intervention. Some pupils felt that this had a negative impact on their experience of the intervention as the un-motivated pupils took up the time and attention of the exercise leader. Finally, it was suggested that unmotivated pupils may have gone to the dance-mat class as they thought it would be 'a skive'.

Hierarchical Structure of third order theme: Negative individual factors

Negative individual factors include the same categories outlined in the the positive aspects of the intervention (i.e. SE, enjoyment, perceived competence, body image and attractiveness and self esteem) There were two third order themes in this category.

Doesn't motivate you to take Part in PA out of school

This theme emerged from pupils comments that taking part in active-gaming was unlikely to motivate them to participate in PA out of school, as illustrated through discussion with May:

Researcher: Ok, excellent. Can you tell me, do you think exergaming would help you to be more active in other areas of your life.....do you think it encourages you or helps you feel more physically active ...?

May: Not really.....Cos it doesn't encourage you to go for a run.

Too active for some people

Some pupils felt that despite the novel form of activity on offer, active-gaming was 'too active' for some individuals:

Researcher: and so do you think for people who don't like P.E. dance mats are still not going to be great or do you think?

Caitlin: Not really it's just too active for girls these days

Researcher: And what do you think some of the reasons for not taking part would be

Erin: Too lazy.....some of them could barely do fitness

This quote illustrates that despite the opportunity to participate in a novel form of PA, some pupils are just too lazy to take part.

6.5 Discussion

Previous chapters have outlined SCT as a suitable theory to underpin a PA intervention. In turn, Studies 1 and 2 focused on the personal and environmental component of the model whilst the current chapter focused on the behavioural component of SCT. This chapter aimed to evaluate participants' experiences of an active-gaming intervention with a further aim of using these findings to inform the development of a larger scale intervention (presented in chapter 7 in the current thesis). Analysis of focus group research provided key insight into participants' perceptions of a small scale active-gaming study and these findings are discussed. In line with the only other known

qualitative research conducted on active-gaming interventions (Cummings and Duncan, 2010) participants reported both positive and negative perceptions of the intervention, and some emergent themes were contradictory indicating that the intervention was not viewed in the same way by all and that tailoring an intervention to cater for individual preferences is important.

6.5.1 Positive aspects of the intervention

Pupils reported a number of positive aspects of the intervention and in line with SCT (Bandura, 1997), data emerged in relation to both positive individual and environmental factors. Interestingly, several of the environmental themes which emerged were in line with those presented in Study 2 of the current thesis; the environment was divided into physical and social environmental factors.

In relation to the physical environment, several pupils reported they liked active-gaming, reporting that it was ‘good fun’ and a positive activity choice for PE. Fun and enjoyment are correlated to PA in adolescent girls, and the finding that girls enjoy this novel activity is a positive one in the development of a future intervention. This finding is consistent with previous research in which fun and enjoyment were reported as the key reasons people take part in active-gaming (2006, Dixon et al. 2010; Liberman, 2006, Hoyseneiemi,).

Some pupils reported that that they liked the option for active-gaming to be conducted as one activity per session, or as a series of circuits around the class, indicating that consultation with girls on aspects such as the class layout is important. It also highlights that as an activity, active-gaming can provide variety, something which has previously been identified as a positive feature of exercise environments for adolescent girls (Gibbons, 2009).

Pupils reported that having active-gaming available as an extra-curricular activity would be welcomed. This highlights the positive feature of active-gaming offering flexibility in terms of choice, something which has been identified as important in influencing adolescent girls’ PA (Gibbons, 2009, Mitchell, 2010). Further, it highlights the individual differences that need to be considered when developing a larger scale intervention, something also reflected on by Maddison et al. (2009). Currently, only 47.5% of Scottish school girls report taking part in extra-curricular activities (Inchley et al., 2010) and thus

finding a way of engaging them in activity out of school is important. These findings indicate that consideration of active-gaming as a way to engage this population out of school is worthy of further attention.

With regard to positive social environment factors, pupils commented on positive features of the personnel delivering the intervention. It was reported that pupils felt there were benefits to having individuals who not PE teachers. Anecdotal evidence provided by FFG (2008) has reported that participants welcome the involvement of specialists delivering particular activities (i.e. a karate teacher for karate). Additionally, several pupils identified the exercise leaders' communication style as a positive feature of the intervention. Study 2 provided an in-depth report on the characteristics and behaviours of exercise leaders and highlighted that positive communication from exercise leaders was perceived as an important behaviour which may influence PA participation. Previous research (Ntoumanis & Standage, 2009; Mouratidis, Vansteenkiste, Lens & Sideridis, 2008) has recommended teachers use an interpersonal style which promotes students need satisfaction and autonomous forms of motivations. Part of this communication style involved offering pupils a chance to input and to provide them with choice and promotes a supportive learning environment. It is also recommended that when working with disengaged pupils, teachers use a communication style which recognises pupils' feelings, highlights the opportunity for choice and develops a strong justification for participation.

A further social environmental factor reported as a positive feature of the intervention was that pupils could take part in the intervention individually or in a group. Chapter 5 highlighted that there is conflicting evidence relating to the exercise preferences of females (Burke et al., 2006; Wilcox et al., 2009) and that it may be the case that some girls prefer to exercise on their own, whilst others prefer a group approach. What is positive for the current study, is that active-gaming can provide both options in one class.

Girls in the current study reported that having their friends in their PE class was a positive feature of the intervention, this finding is consistent with findings reported in Chapter 5 and reflects previous research which highlights peer support during PE as a positive feature of the environment and the majority of adolescent girls showing a preference for exercise with friends (Biddle, Coalter et al., 2008; King et al., 2008; Smith, 1999; Bungum & Vincent, 1997).

A further positive feature of the intervention was having a single sex class. It has previously been reported that adolescent girls prefer to be physically active in a girls only environment (Mitchell, 2010). This finding is also consistent with the results reported in Chapter 5 and with research conducted in Scotland in which 37% of girls feel that PE should be conducted in single sex environments (Inchley et al., 2010).

There were some positive individual factors reported about the intervention. In relation to individual factors, some girls reported that active-gaming provided them with an opportunity to 'get fitter and feel better'. Dixon et al., (2010), highlighted that adolescents felt that active-gaming provided an opportunity to increase activity, improve fitness and change body shape, findings the current study goes some way to supporting this.

Finally, several pupils in the current study reported that they would take part in the activity again and would recommend active-gaming to friends. This is viewed positively because retaining girls' interest and engaging them in PE is currently a challenge. This also supports the need to empirically test this notion in more detail in a larger scale intervention.

6.5.2 Negative aspects of the intervention

Despite positive feedback relating to the intervention, less enthusiastic opinions were also reported. The most commonly reported negative aspect of the current intervention was in relation to the music accompanying the dance mat. Every girl reported that they did not like the music; many of the tracks were in Japanese and were aimed at a younger audience. Previous research relating to active-gaming has not reported on the impact of the music accompanying the active-game on PA levels or opinions on active-gaming. The finding in the current study suggests that music plays an integral role in the girls' enjoyment of the activity. It has been suggested that music which is appropriately selected can enhance enjoyment levels and adherence to physical activity (Terry, 1997) and for this reason the music in-built or accompanying an active-gaming programme requires careful consideration.

Pupils also reported that there was a lack of choice available to them in terms of games, programmes and consoles. As was previously reported, choice plays an important role in adolescent girls' PA behaviour and thus the provision of choice in a future intervention requires additional consideration. The current study only offered pupils one type of active-gaming programme (DDR) and the levels of choice in this were limited. Given that less than half of Scottish school girls report that they have not been consulted about what

PA they would like to do at schools (Inchley et al., 2010), it is proposed that the opportunity to have more choice in relation to the active-gaming console and programme is introduced.

Pupils commented that there were no organised breaks during the active-gaming sessions and they felt that it would have been valuable to have water available. Further, there was no rota for taking turns on the dance mats and pupils felt this would have been a valuable contribution. Finally, pupils felt that having a breakout/rest area would have enhanced their experience of the intervention. Water was however readily available in the school corridor and it is not normal practice to have water fountains in each PE facility. Further, a break-out and rest area is not common place within the PE environment. Nonetheless, participants believed this would have enhanced their experiences and thus consideration of these points in the delivery of future active-gaming interventions is proposed.

The room in which the activity took place was reported by many pupils as small and stuffy. Further the layout and quantity of the mats was criticised by some pupils and this requires further consideration. Pupils reported that it was sometimes difficult to take part in the activity effectively as the layout was not optimal. Additionally, some pupils felt that the class size in the current intervention was too big, however, this was related to not having enough equipment to go round and the size of the facility being too small to cater for these numbers. Having the basic provisions in place for an activity to take place has been identified as a positive feature of the physical environment both in the current thesis and in previous studies (Coalter, Biddle et al.2005). Accordingly, the class layout and quantity and quality of equipment provided in future interventions require consideration.

When asked about taking part in active-gaming either at lunch time or after school, several pupils reported that they would not take part in this opportunity. In particular, pupils reported that they would rather take part in more sedentary activities during these times. Competing activities have previously been highlighted as a negative correlate of PA (Biddle et al., 2005). Traditionally, computer games have been associated with boys, but the increase in social networking sites and instant messaging services are linked to an increase in computer use in girls (Currie et al., 2011). However, whether this transference of increased computer use in girls can be translated into active-gaming remains to be seen.

It was reported that the actual activity (dance mats) was not enjoyed by some girls. In general, previous research conducted in relation to active-gaming has reported only positive feedback in relation to dance mats (Lieberman, 2006; Hoyseneiemi, 2006; Dixon et al., 2010). This finding is important as it highlights that individual differences and preferences play an important role in exercise adherence and therefore, in support of SCT, the individual needs to be given consideration in the development of any PA intervention. Further, the provision of a 'one-size fits all' approach to active-gaming and the provision of an alternative activity to normal PE alone, is unlikely to reach all girls.

Pupils reported a number of negative social environmental factors which they felt had an impact on their experience of active-gaming. Pupils felt there should have been a reward for taking part in the intervention. It could be suggested that this findings indicates that the activity itself was not a motivator for participation. Indeed, previous research suggests that intrinsic motivation can be increased by teachers who use positive and knowledgeable feedback and promote PA in a non-threatening manner (Koka & Hein, 2003). In the current study, pupils reported that the exercise leaders could be 'too moany', didn't encourage and join in, they felt the teachers were not authoritative enough and that sometimes they were not aware of everything going on in the class. Given the current intervention was only focused the actual activity and not on the wider psycho-social environment, it could be suggested that the climate of the class was not delivered in a manner which enhanced intrinsic motivation. Investigating the delivery of an active-gaming intervention which promotes a class climate which encourages intrinsic motivation is welcomed.

The class organization in relation to those taking part also received some criticism and pupils reported that having disruptive pupils in the class compromised the effectiveness of the intervention. Pupils also expressed a wish to choose who is in their group. Chapter 5 highlighted that the make-up of the class is perceived as a factor which influences PA participation in this population and should be considered in the development of a future intervention.

A negative individual feature of active-gaming identified by some pupils was that it did not motivate them to be active outside of school, as has previously been identified engaging girls in PA outside the school environment is a challenge (Inchley et al., 2010) and examining the role of active-gaming in doing this is welcomed. Finally, pupils

reported that regardless of the novelty of the activity, active-gaming would simply be too active for some individuals. In essence girls felt that whilst active-gaming was a relatively positive activity, in itself, the activity would not be enough to engage hard to reach participants.

6.6 General findings and future research

Despite the intention and focus on keeping the research to the highest quality possible, the key limitation of the current study is the low participant numbers. Nonetheless, it is comparable with previous research in the area (Cummings & Duncan, 2010), additionally, the current study was viewed as a pilot study for the final intervention and the findings provided some important guidance for the development of the final intervention, something advised by Foley and Maddison (2010).

Recruitment into the study was poor and thus it could be suggested that the offer of active-gaming in isolation might not be sufficient to engage low active girls. It may reflect the specific ethos towards PA in this school, and unfortunately, it may also reflect the poor adherence to instructions with regards to the return of parental consent. It is therefore proposed that an 'opt out' rather than an 'opt in' system is adopted in the final intervention.

From the findings, it is suggested that the continued use of the dance mats is likely to be dependent upon the environment in which the game is played, and the role of the instructor in providing the external motivation in order to participate. Thus, direction of resource towards introducing these systems into a school and community setting should be carefully considered with respect to the support that will be offered in terms of staff and locality. Without taking these wider issues into account, it is unlikely that the introduction of such a system will be sufficient to engage low active adolescent girls.

6.7 Conclusion

This pilot study evaluated adolescent girls' experiences of an active-gaming intervention delivered in the place of traditional PE. Girls reported both positive and negative features of the intervention. It is of interest that the findings relating to the perceived effectiveness of the intervention focus largely on the organisation and environment in which the intervention was undertaken rather than on the specifics of the intervention; highlighting

that often it is not the actual activity being conducted that is of importance, but aspects of the climate and composition of the class which influence participation, a finding reflected in other research with disengaged girls in Scotland (Mitchell, 2010). The results indicate that further research, with consideration of personal and environmental factors is required in order to increase our understanding of the role of active-gaming on PA in this population.

CHAPTER 7: DEVELOPMENT, DELIVERY AND EVALUATION OF AN ACTIVE - GAMING INTERVENTION FOR ADOLESCENT GIRLS

7.1 Introduction

This chapter aims to provide a brief overview of PA interventions, specifically those targeted towards adolescent girls in a school PE environment. In turn, the findings of the preceding chapters in the current thesis are considered in relation to the development of a SCT based active-gaming intervention and a rationale for this intervention is proposed. The intervention methodology is detailed, results are provided and the findings of the current study and future directions are discussed in line with appropriate literature.

7.2 Physical activity interventions and adolescent girls

Despite the inclusion of adolescent girls as a priority group for the Scottish Government (NHS Scotland, 2009) and a high number of PA interventions targeted towards this group, low levels of PA in this population remain. It is therefore suggested that future research is necessary and indeed, finding out ‘what might work’ in increasing PA levels in this target group is required.

7.2.1 Summary of physical activity interventions: Systematic reviews

There is evidence to suggest that school-based interventions are effective in increasing PA in children and youth (Dobbins, DeCorby, Robeson, Husson & Tirilis, 2009; Dobbins & Dwyer, 2004; Khan, Ramsey et al, 2002; Ciliska, Wilson-Abra, et al., 2003; Dobbins, Lockett, et al., 2001). In order to synthesise findings, a number of systematic reviews of PA interventions have been conducted and have detailed important findings in this field of study. These reviews are important in detailing previous interventions which have focused on adolescent girls and highlighting the aspects of these interventions which have and have not been successful, so that they may be considered in the development of future interventions and practical guidelines. The current chapter does not seek to provide an in-depth review of interventions targeted towards this population, but rather, seeks to highlight the key findings of these reviews and key interventions in order to inform an SCT based active-gaming intervention.

An early systematic review conducted by Stone and colleagues (Stone et al., 1998), reviewed the effects of PA interventions in youth in school and community settings. They reviewed 22 school based studies from 1980 to 1997, 14 of which were completed and eight of which were in progress. Of the 22 studies, four took place in secondary schools, and one of these studies took place outside of the USA (in Australia). General findings suggested that girls should receive specialised attention as compared to boys in relation to PA. They also reported that schools were an effective and appropriate infrastructure for implementing PA interventions.

In relation to the methodologies adopted, the majority of the studies included in the report employed SCT as a theoretical framework on which to base interventions. There were no specific findings in relation to the length of interventions targeted towards this population. Indeed, the studies detailed in this review ranged from a few weeks to multi-year. Further, the length of follow up beyond the completion of studies varied from nil to two or three years, all the way to seven years. The personnel delivering PA interventions varied between existing school staff to PE specialists, with a few studies having parent, peer or policy components. The dependent variables measured included knowledge, attitudes and self-reported PA behaviours. Some studies included a fitness component and the System of Fitness Instruction Time (SOFIT) was the most commonly used instrument to measure PA during PE.

An additional systematic review of interventions aimed at increasing PA, across a variety of populations, was conducted by Kahn and colleagues (2002). Whilst this review was not targeted specifically towards adolescent girls, the review assessed PA behaviour across a number of domains including school based interventions, classroom based interventions, interventions based on social support in both the family and community and individually tailored interventions. Findings indicated that two informational based interventions were successful at increasing PA behaviour as were three behavioural and social interventions and one environmental and policy intervention. There were an insufficient number of studies to examine PE based interventions and this is highlighted as an area which requires additional research.

A further review examining controlled trials promoting PA in children and adolescents was conducted by Van Sluijs and colleagues (2007). The study reviewed 33 studies aimed at children and 24 focused on adolescents. Interventions targeted towards adolescent girls

ranged in length from one-off informational sessions to interventions lasting a number of years. In relation to target groups, some interventions were focused on girls with low levels of PA, whilst others focused on participants with a varying PA levels. The majority of adolescent based studies in the review were conducted in the school environment, with 20 of these evaluating school based interventions. One high quality randomised controlled trial reported a statistically significant effect, but generally results were inconclusive. The strongest support in the review was found for multi-component interventions. It was recommended that school based interventions include the involvement of family and community. Van Sluijs and colleagues highlight the inclusion of environmental aspects in PA interventions and view this as a positive step.

A further examination of interventions was conducted by NICE (2008) who focused their research on adolescent girls, with the core research aim of assessing ‘what interventions are effective in increasing levels of PA / core physical skills in adolescent girls aged 11-18 ?’. Studies included school based single and multiple behaviour interventions, counselling based interventions, and educational based interventions. Results across each of these domains were varied, inconsistent and invariably inconclusive. Nonetheless, there were some recommendations to come from the report, in relation to school based interventions, they reported that characteristics of successful interventions were not consistent across studies, but of those which were successful, they tended to be self-monitoring, stage matched and multi-level. In terms of counselling based interventions, which bear relevance for the PA consultation component of the current thesis, these tended to be more successful when targeted at girls over age 14. It is apparent that the summary of findings put forward by Van Sluijs and colleagues, varied from the conclusions drawn by Biddle and colleagues (NICE, 2008), leaving researchers in a difficult position moving forward.

7.2.2 School based interventions

Despite the relevance of the NICE review, they excluded ten studies as they were based during PE. Given the current study is based during PE, it is important to highlight positive features of PE based interventions targeted towards adolescent girls. There are a number of high profile school based PA interventions commonly referred to in PA literature, such as; Sports, Play and Active Recreation for Kids (SPARK), Child and Adolescent Trial for CV Health (CATCH) the Girls health Enrichment Multisite Studies (GEMS), PLAY, SMART, Planet Health, Middle School PA and Nutrition (M-SPAN), Lifestyle Education

for Activity Project (LEAP) and Program X. With the exception of M-SPAN, LEAP and Program X, these interventions were conducted with elementary school-aged children and so the generalisability of these findings is limited for the current intervention, but an awareness of their effectiveness is important.

Of those which have relevance for the current intervention, M-SPAN (McKenzie, Sallis, Prochaska, Conway, Marshall & Rosengard, 2004). was a two year intervention based on SCT and focused on staff development for modifying PE, involved the creation of student advocacy groups and offered extra-curricular activities for both PA and nutrition. The project indicated that environmental and policy interventions were successful at increasing PA in boys, but not girls. They proposed that further research examining the role of school environmental and policy interventions and potential barriers to their implementation is important to overcome these barriers and maximise the potential of such interventions.

The LEAP programme (Dishman, Motl, Saunders, Felton, Ward, Dowda & Pate, 2004). was a school based intervention which aimed to increase PA and fitness in adolescent black and white girls and aimed to evaluate the effects of the programme on cognitive constructs from SCT (i.e. SE, outcome expectancy value, goal setting and satisfaction). It was reported that in the LEAP programme, SE, perceived behavioural control, enjoyment, social support and access to PA equipment were independently related to PA (Ward, Dowda, Trost, Felton, Dishman & Pate, 2006). The LEAP study showed an increase in PA in both the short term and long term, suggesting that a comprehensive PA intervention that is fully implemented and maintained in the school environment can increase PA levels in secondary school girls.

Program X (Lubans, Morgan, Callister, & Collins, 2009), focused on healthy eating and PA promotion with boys and girls with a mean age of 14. The programme was 10 weeks in length and consisted of five main components: a) enhanced school sport program focused on lifetime PA, b) Information sessions and interactive summary lectures focusing on PA and healthy eating, c) Pedometers to encourage PA self-management strategies d) PA and nutrition handbooks and monthly information newsletters for parents, e) Social support for healthy behaviours via email. In relation to girls, improvements were seen in relation to number of step counts per day and number of fruit servings eaten. Female participants in project X showed a mean increase of 999 steps per

day and an increase in fruit and vegetable servings, but there was no significant effect on sedentary behaviour.

PE based interventions for adolescent girls- America and Canada

Gibbons (2009) reviewed a number of studies which consistently highlight particular features of PE courses adolescent girls perceive as important. These features include a) a choice of a variety of physical activities with a focus on individual lifetime activities, b) the opportunity to develop relevant physical skills and personal fitness c) a positive learning environment that includes being with friends and protection from harassment d) an emphasis on enjoyment of the PA, and e) active involvement of students in course development. Further, it has been suggested that if these features are incorporated, adolescent girls are likely to remain engaged in PE.

In order to establish features central to Canadian schools which have been successful in engaging teenage girls, Gibbons (2009) examined 32 senior PE courses in Canada which have successfully maintained high enrollment (have documented enrollment of at least 50 per cent female students) of adolescent girls. Through analysis of course outlines, student questionnaires and interviews with teachers, six main themes emerged; focus on lifetime activities, value added options, student involvement in course design, gender as a course design feature, authentic assessment and positive and respectful class environment. Gibbon's findings are consistent with previous studies in this area (Felton, Saunders, Ward, Dishman, Dowda & Pate, 2005; Flintoff & Scraton, 2001; Pate, Ward, Saunders, Felton, Dishman & Dowda, 2005; Schofield, Mummery, Schofield & Walmsely 2002; Ward, Saunders, Felton, Williams, Epping & Pate, 2006). These guidelines in relation to course content, course structure and teaching and assessment strategies provide useful guidance for the design of PE based interventions.

Fit for Girls intervention programme – Scotland

Despite useful guidelines stemming from Gibbons (2009), her research was focused in the USA and Canada. Given the current study is focused in Scotland it is important consideration is given to current interventions and initiatives being conducted in this region. Within Scotland, there has been a large scale intervention, named Fit for Girls (FFG) targeted towards adolescent girls in the school environment. The programme has been implemented in all secondary schools, in Scotland over a three year period from 2008. The initiative aims to develop training programmes for PE staff and active schools coordinators in order to facilitate change in schools. Part of this process is achieved

through interactive practitioner workshops to allow them to share and exchange knowledge, tools and skills enabling them to consult, plan and implement positive PE experience and sustainable PA programmes for adolescent girls. The programme also seeks to enhance links between schools and the community (Inchley et al., 2010). Whilst the aims of each school will be individualised according to their specific needs, there are national core objectives which underpin the campaign. These objectives are presented in table 7.1.

Table 7.1: National objectives of the Fit for Girls programme

Key objectives of FFG programme

- To create and implement school development plans that reflects girls' needs
 - To increase girls' enjoyment of PE, physical activity and sport
 - To increase and improve opportunities for participation, both in and out of school
 - To develop an integrated approach between PE, PA and sport
 - To improve transition between primary and secondary schools in terms of participation in PE, PA and sport
 - To improve the links between school and community sport
-

The evaluation process seeks to assess the impact of the FFG programme on levels of participation in PE, PA and sport amongst secondary school girls. A variety of methods have been adopted in order to address this aim. The first interim report of the campaign (Inchley et al., 2010) collected questionnaire data about PA, PE and extra-curricular school-based activities, as well as girls' health and wellbeing, from 17,853 girls with a mean age of 13.7. This data forms the baseline findings, from which the effects of the FFG programme will be monitored. In line with the findings of previous chapters in the current thesis and SCT (Bandura, 1986), it was suggested that the wider psycho-social environment is perceived as highly influential on PA behaviour in adolescent girls (Mitchell, 2010; Inchley et al., 2010). This baseline data is important in developing further our understanding of PA behaviour in adolescent girls in Scotland and the development of the current intervention.

In relation to the impact of the FFG programme, early analysis examined the experiences and engagement of adolescent girls in PE classes during the FFG intervention (Mitchell, 2010). Focus groups conducted with 36 'disengaged' participants, were shaped by SCT (Bandura, 1986) and competence motivation theory (Harter, 1981). Preliminary evidence

suggested that activity choice, perceptions of competence and peer influences were the main reasons for disengagement in PE. Findings highlighted that the wider psycho-social environment in which PE is conducted may influence participation and enjoyment more so than the PA itself, a finding which is consistent with Chapters 4, 5 and 6 in the current thesis. In relation to positive changes in relation to both experiences and engagement, being provided with a choice of activity, being active with friends and invariably taking part in single sex classes were all highlighted as positive features of the FFG campaign. More conclusive results from the FFG study are yet to be published but will focus on 20 participants from four case study schools over a one year period. It is important to note that FFG focuses its analysis on ‘disengaged’ pupils, highlighting that the needs of ‘less well represented’ pupils and low active girls may differ to participants who have previously been well served and are already active.

7.2.3 Social Cognitive Theory based interventions

Previous chapters have highlighted SCT as an appropriate theory to underpin PA interventions. In relation to adolescent girls there are a number of PA interventions which have been informed by SCT and this section outlines the manner in which a small number of such studies have been implemented. Horzt and Petosa (2006) examined the effects of a SCT based intervention on leisure time PA in high school students. The ‘Planning to be Active’ intervention, focused on a behavioural skill-building curriculum based on SCT, with a particular focus on self regulation, social situation, strength of SE and outcome expectancy value. Pupils were exposed to one PE class a week for an 8 week period. Self-regulation was enhanced through goal-setting, strategic planning, self-monitoring and self-reflection. Education in relation to strength of SE included identification of barriers to PA and strategies for overcoming these barriers. Outcome expectancies training related to experiencing physical, social and self-evaluative aspects of exercise outcomes. Finally, social situation focused on enhancing, evaluating and developing a social environment conducive to achieving PA goals. It is also reported that in addition to these lessons, students received incentives based on their PA goals, but it is unclear what these incentives were. The results indicated that the intervention was successful in increasing moderate leisure time PA in the experimental condition. However, this study did not differentiate the effects between boys and girls and the sample was not randomised. Nonetheless, the findings support the use of a SCT based curriculum and provide some useful application of SCT with this population.

An additional study utilising SCT, was conducted by Lubans and Sylva (2006) who delivered a ten-week structured health and exercise programme to 38 pupils aged 16-18, who were enrolled in a health and fitness module at school. The health and fitness module was offered as an alternative to the team sports option. The Lifetime Activity Program (LAP) sought to increase PA through increasing knowledge and confidence in relation to PA and through increasing peer social support. The programme aimed to develop socio-environmental factors through providing guidance relating to increasing social support, such as selection of training partners, planning of training sessions, identifying barriers to PA and the importance of motivation and feedback. Pupils exposed to the intervention significantly increased their PA and SE as compared to comparison condition. At the three month follow up, increases in PA were not evident, but the study still provides some support for the use of a SCT based intervention for increasing adolescent PA in the short term.

7.2.4 Summary

It can be seen that there have been a multitude of interventions which have focused on PA and more specifically on adolescent girls in the school environment. However, the conclusions of these reviews are often conflicting and there are issues relating to the methodologies adopted. Even so, this review has highlighted important findings which can be taken into the development of the current intervention. In particular, Gibbon's (2009) findings are not only relevant in terms of target population and the environmental delivery, but are reflected in the findings of the current thesis so far.

7.3 Intervention Rationale

The current study employs action research and Chapter 3 outlined key principles of action research of which cycles of reflection were highlighted as a key feature. Accordingly, reflection on each of the previous studies conducted in the current chapter is considered in the development of the current study.

Chapter 1 highlighted that identification of correlates associated with PA is important in order to develop effective PA interventions (Sallis et al., 2000). Specific to adolescent girls in Scotland, the 2010 Physical Activity and Health Alliance's (PAHA, 2010) summit on teenage girls, drew on evidence both locally and internationally in order to highlight key barriers and facilitators to PA in relation to adolescent girls. These findings are in line

with the correlates identified in Chapter 1, and with several of the findings highlighted in the current thesis and are summarised in table 7. 2.

Table 7.2: Summary of facilitators and barriers to physical activity in adolescent girls, amended from PAHA, 2010

Barriers to PA behaviour in adolescent girls		
General Issues	Social and psycho-social issues	School PA issues
<i>Lack of time*</i>	<i>Social pressure to conform*</i>	<i>Inappropriate activities*</i>
<i>Changing priorities*</i>	<i>Perceptions of femininity</i>	<i>Poor PE environment*</i>
<i>Lack of motivation*</i>	<i>Body image</i>	<i>Negative experiences of the school environment*</i>
<i>Limited active destinations and PA settings</i>	<i>Having to perform in public*</i>	<i>Wider conducive environment issues*</i>
	<i>Fear of forced competition*</i>	<i>Lack of access to facilities*</i>
Facilitators to PA behaviour in adolescent girls		
<i>Social and family influences*</i>		
<i>Enjoyment*</i>		
<i>Identify role models*</i>		
<i>Socialisation*</i>		
<i>Activities which promote fun, play and enjoyment*</i>		
<i>Choice of activity*</i>		
<i>Consultation with young people on PA preferences*</i>		
<i>Personal freedom activities (such as walking and cycling)</i>		
<i>Enjoyment and fun with friends*</i>		
<i>*Denotes finding reflected in the current thesis</i>		

In addition to the barriers and facilitators highlighted, three consistent messages extracted from PA intervention literature, were proposed as factors which will lead to greater success in increasing PA in interventions:

- Targets girls alone rather than mixed sex approaches.
- Focuses on PA rather than additional health behaviours.
- Involves families.

In line with these suggestions and findings from each of the preceding studies, the current intervention will be focused on girls only and will focus only on PA. In relation to family involvement, girls will be encouraged to seek social support from peers and family members.

It can be seen that correlates of PA in adolescent girls can be attributed to personal, environmental and behavioural factors. In turn, SCT which proposes a triadic reciprocal interaction between each of these three factors (detailed in figure 2.1 p 25.) was introduced and the use of SCT in previous PA interventions was highlighted. Chapter 1 also introduced active-gaming as a possible novel experience for engaging adolescent girls and the absence of active-gaming interventions with a psychological focus and strong theoretical grounding was highlighted. Accordingly, Bandura's SCT was proposed as a suitable theory on which to base the current thesis and an SCT model of health promotion (Figure 2.2 p 27) was introduced as a means for shaping and delivering the current thesis.

In relation to the SCT health promotion model, Study 1 focussed on the development of self efficacy, outcome expectations and PA goals. Accordingly, the concept of PA consultation (Loughlan & Mutrie, 1995) was presented as potential means for targeting these factors. Traditionally PA consultations have attracted individuals in specific stages of change (Lowther et al., 1999), indicating that different exercise promotion programmes are attractive to individuals of differing PA levels. Study 1 focussed on girls in the contemplation and preparation stages of change. Whilst there were no positive significant results in relation to the outcome measures of PA and the targeted psycho-social factors, there was a positive progression through stage of change and PA consultation was identified as a process adolescent girls 'buy-into' and enjoy. This is an important finding and provided strength for using PA consultations to target the psycho-social component of the SCT based health promotion model for delivering the current intervention. Nonetheless, researcher feedback from Study 1 indicated that one-to-one consultations are potentially too time consuming for delivery in the school environment and so the current study aims to deliver PA workshops developed through the key principles of PA consultations. Further, participant numbers in Study 1 were potentially too low to identify significant changes in outcome variables, and thus increasing participant numbers was also a priority in the development of the final intervention. It was anticipated that workshop delivery would help achieve this. The length of the current intervention was dictated by the school term dates. In line with an action research methodology, the current intervention was delivered in a real-life setting and it was important to examine the effects of the intervention as they would occur within the school curriculum.

Consideration of the socio-structural factors perceived as influencing PA in adolescent girls were explored in Study 2, which investigated the perceived impact of the environment on PA in adolescent girls in school PE. Key findings from Study 2 which will inform the current intervention included: the importance of the provision of basic facilities and infrastructure to support PA, as well as enhancing the social environment through developing aspects of the class climate and class composition. Finally, an awareness of the positive and negative characteristics of exercise leaders, with a focus on delivering the intervention with a socially enriched leadership style was considered.

In line with these findings, the proposed intervention will seek to enhance the availability of choice available to participants and focusing on a number of other sub-components of intrinsic motivation, specifically enhancing interest and enjoyment, perceived competence and the effort and importance placed on the activity. Additionally, the researcher sought to develop and deliver the intervention in a socially enriched environment, which aimed to develop cohesion between class members and the inclusion of class ground rules were thought to foster a positive class climate. The researcher also encouraged choice and the development of self-regulation and self efficacy, through a number of strategies and developed social support networks throughout the intervention. Suggestions from Study 2 also encouraged researcher participation in the intervention in order to inject fun and enthusiasm into the project. Further, the researcher's awareness of the perceived positive and negative attributes of a PA exercise leader were considered throughout the development and delivery of the intervention.

Study 3 evaluated the effectiveness of a pilot active-gaming study. Findings indicated that active-gaming emerged as an appropriate tool for implementing such an intervention. Positive feedback included indications that many girls liked the activity and that they felt it was a good option for PE. They enjoyed being able to set the difficulty level and element of competitiveness as well as having a girls only class. Finally, participants felt that active-gaming was a good way to get fit and made them feel better and indicated that they would take part in the activity again and recommend it to friends. However, there was some negative feedback which was considered for development of the final thesis. For example, feedback from the primary researcher and the focus groups suggested that several participants were resistant and that staff involvement in the project was limited. In some cases, the class was seen as a bit of a 'holding bay' for pupils who didn't want to take part in normal PE. Accordingly it was deemed appropriate to make sure in the final

intervention all PE staff were aware of and where possible integrated in, the project and that only girls who wished to do active-gaming as a PE option took part. Further, given recruitment problems evident in earlier phases of the thesis, an ‘opt out’ approach to consent was adopted.

The current study considered the principles outlined by studies 1-3 and the literature review. In line with this, five key principles were used to underpin the development of the intervention:

- To use PA consultations to enhance psycho-social correlates of PA including SE, self-regulatory SE and intrinsic motivation, with a focus on enhancing self regulatory skills such as self talk, and goal setting.
- To encourage PA participation both within and out with the school environment, through discussion, developing techniques to overcome barriers, seeking social support and introducing active-gaming as an enjoyable PA pursuit.
- To manipulate the environment to foster social support and a positive and supportive environment for PA during PE.
- To offer choice and ownership where possible.
- To ensure enough equipment and maximise the availability of basic provisions for the delivery of the intervention.

7.4 Aim

The aim of the current study was to develop, implement and evaluate the effectiveness of an active-gaming intervention targeted at adolescent girls in the City of Edinburgh, Scotland. This primary aim had two main sub-sections: Firstly to evaluate the effectiveness of an active-gaming intervention on PA behaviour and key psycho-social correlates of PA. Secondly, to evaluate participants’ experiences of the intervention from a social validity perspective and through researcher case notes.

7.5 Methodology

7.5.1 Participants

244 girls aged between 13 and 16 from years S3 and S4 of a secondary school in the City of Edinburgh were selected to take part in an SCT based active-gaming intervention and were provided with an information sheet and opt out form (Appendix N). A power calculation was conducted in G*power in order to inform the sample size required to find

significant differences. This informed the number of girls approached for recruitment. Information sheets and opt out forms were posted to the homes of all girls and where necessary, completed by their parents. Six opt out forms were returned, three participants cited as not wanting to miss class time as a reason for withdrawal and three gave no reason. A full trial profile is included in figure 7.6.

7.5.2 Procedure

The procedure is presented in two components; i) the development of the intervention and ii) the delivery.

Intervention Development

The current intervention was developed to enhance the key variables of; PA, self efficacy, self-regulatory self efficacy, intrinsic motivation, social support, choice and stage of change. The manner in which these were developed and incorporated into the intervention is described below:

Choice

All participants were given the opportunity to complete a short ‘choice’ questionnaire (Appendix O) which was conducted no more than four weeks prior to the start of the intervention. The questionnaire asked participants if they would like to take part in active gaming, what types of active gaming program they would be interested in utilising and who they wished to be active with.

Choice and class climate were also enhanced by asking pupils to agree to ground rules in the first PA workshop (an outline of a PA workshop is in the delivery section) (Figure 7.3). These ground rules established the content and delivery of the active-gaming aspect of the intervention. Pupils had the opportunity to switch in and out of the experimental pathway if they wished to do so, but this was not actively encouraged by teaching staff as they wished pupils to follow pathways where possible.

Finally, choice was inherent in the PA workshop aspect of the intervention, whereby individuals were encouraged to make PA behavioural choices based on their own needs and wants.

Social Support

In order to promote social support pupils were asked to indicate a preference for others they wished to be active with in the 'choice' questionnaire and this was followed as closely as possible when groups were organised for randomisation. Further, the PA workshops promoted social support for PA and this was encouraged in the workshops and throughout the active-gaming sessions.

Personal Correlates

The personal correlates of self efficacy, self regulatory self efficacy and intrinsic motivation were targeted through the PA consultation workshops. A clear outline of how PA consultation targets the personal correlates previously mentioned is given in Chapter 4 (Study 1, pp 49-99).

Intrinsic motivation was subsequently added in line with the emergent findings of the current thesis. Intrinsic motivation was targeted through enhancing choice, ownership and goal setting. The intrinsic motivational inventory (IMI) has previously been used with adolescents (Fairclough, 2003). Items included interest and enjoyment, perceived competence, effort and importance and perceived choice. These consisted of statements relating to the activity the students had participated in (e.g., 'I enjoyed this activity very much' (enjoyment); 'I think I am pretty good at this activity' (perceived competence). Following completion, the questionnaires were scored and mean values for enjoyment and perceived competence were generated for subsequent analysis.













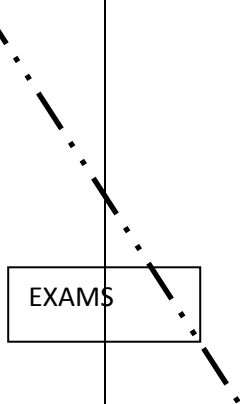


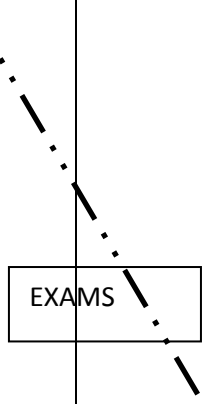
Delivery

Programme Delivery

Participants were organised according to their responses in the choice questionnaire and according to their PE day. Participants were then randomised to either the control or experimental condition. In total there were eight groups that combined to form a control group (Monday control, Wednesday control, Thursday AM control, Thursday PM control) and an experimental group (Monday experimental, Wednesday experimental, Thursday AM experimental, Thursday PM experimental). Within the experimental group one group had the option to continue the programme into a second term, resulting in 2 sub-groups; group '5 week' received the intervention for 5 weeks and group '10 week' received the intervention for 10 weeks.

Of those selected to take part for 10 weeks (allocated according to day of PE), five girls opted to return to their normal PE class after five weeks citing a preference for the alternative activity on offer, 'bored of active gaming' or no reason for their decision. The participant numbers are lower for this section as the 4th year girls did not take part in the third phase of data collection, due to exam commitments. Details of the intervention delivery and groupings are detailed in figure 7.3.

The intervention was delivered to those in the experimental condition in two components, which included active gaming sessions in place of PE and PA workshops. Pupils in both conditions completed a PA questionnaire pre-intervention and at week 5. A sub-group completed the questionnaire again at week 10

Day and Condition	Monday Control (S3)	Monday Experimental (S3)	Wednesday Control (S4)	Wednesday Experimental (S4)	Thursday AM Control (S3)	Thursday AM Experimental (S3)	Thursday PM Control (S4)	Thursday PM Experimental (S4)
		Group ‘5 week’				Group ‘10 week’		
Questionnaire			 W’shop		 W’Sshop			 W’Sshop
1		 W’shop	 W’Sshop		 W’Sshop	 W’Sshop		
2								
3								
4								
5								
Repeat						 Reminder		
BREAK (2 weeks)								
1								
2								
3								
4								
5								
Repeat								



Key:	Normal PE 
	Active Gaming 

Figure 7.1: Delivery of the intervention detailing control and experimental groupings.

Setting

The active-gaming component of the intervention took place during PE and was in place of the pupils' original choice for PE (either; fitness, dance, badminton, basketball, athletics or rounders). Active-gaming took place in the PE class room which was cleared of table and chairs each period (Figure 7.4). The PA workshops took place at a time that was suitable for the school and pupils. The workshops were carried out in the school environment, in a classroom with a glass paneled door, or a similar alternative.



Figure 7.2: Active-gaming class layout

Delivery of Active-Gaming Sessions

Pupils selected the type of active-gaming program they would like to take part in during PE through the 'choice' questionnaire, (Appendix O). All pupils reported that they would like use of the Nintendo Wii and a variety of Wii games. There were nine Nintendo Wii's provided and over 15 varieties of game provided (with multiples of some games). There were nine TV screens available.

The active-gaming sessions were delivered by the researcher and she was sometimes assisted by a research assistant. During the first active-gaming class, pupils developed a working agreement for the active-gaming sessions that established ground rules and this was displayed in the classroom for the duration of the project (Figure 7.5). At the start of

each class the pupils expressed their personal preferences for the format and layout of the class. For the first five weeks this was in small groups or pairs and pupils chose the games they wanted to play. For those in group '10 week' this continued through to week 8, but in weeks 9 and 10, there was a whole class approach whereby the game was projected onto the classroom wall and the girls participated as a group.

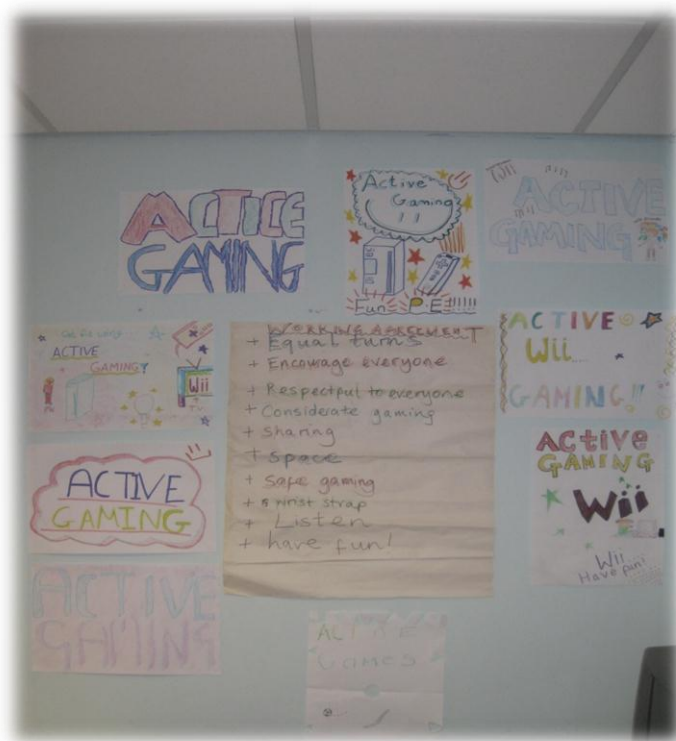


Figure 7.3: Ground rules in the Active Gaming class.

Throughout the intervention, pupils were actively encouraged to use games which they felt would keep them active for the whole period, but ultimately the choice was that of the participants. Some participants played the same game for the duration of the period and some changed between games throughout the period. Similarly, some girls played the same game every week, whilst others tried different games each week. Some pupils wished to record their high scores and these were recorded on the classroom wall (figure 7.4), this was not compulsory and many pupils opted not to do this.



Figure 7.4: Participant ‘high scores’

Delivery of PA Workshops

The experimental group received PA group workshops out-with PE. During the group workshops (groups of 4-6), participants were asked to discuss their current and past levels of PA, their self efficacy in relation to PA and issues relating to their decisional balance to be physically active. From this, the researcher worked with the participants to try and establish possible opportunities for individuals to increase their PA levels. Part of this process included goal setting, positive self talk and identifying social support for being physically active as guided by PA consultations (Loughlan & Mutrie, 1995).

The participants were provided with a printed PA consultation pack (Appendix Pi) based on the opportunities identified in the meeting. The meetings were focused on PA behaviour both in and out of school and each meeting lasted between 45 and 55 minutes. After three weeks, the researcher met with the participants to reinforce the advice given and opportunities identified in the first workshop. This provided an opportunity for the participants to discuss any difficulties they had to date to re-set goals as necessary, discuss potential improvements to the active-gaming sessions and to ask any questions that they may have. A further consultation pack was provided at the second consultation (appendix Pii). A laminated PA reminder was given to participants still taking part in the intervention (Group ‘10 week’) at week 6.

Control Group

The control and experimental groups completed a PA questionnaire (Appendix Q) at weeks 1, 5 and 10. The control group was allocated to their PA preference which they had stated at the beginning of term. The content and format of these activities were at the discretion of the class teacher.

7.5.3 Measurement and Data Analysis

Section 1: Examining the effects of the intervention on PA and Psycho-social Variables

Aim 1 in the current study was to evaluate the effectiveness of an active-gaming intervention on PA behaviour and key psycho-social correlates of PA. This aim was divided into three sub-aims: Aim 1 was to evaluate the effectiveness of a five week intervention on physical activity and psycho-social correlates of physical activity on the control and experimental conditions. Aim 2 sought to compare the effects of a 5 week intervention on a sub-group of low and high active participants. Aim 3 was to assess if there were differences in outcome measurements between a sub-group of participants who took part in the intervention for five weeks (Group '5 week') and those who took part for ten weeks (Group '10 week'). PA and key psycho-social variables were measured pre and post intervention to evaluate the impact of the intervention on these variables.

PA

The PAQ-A (Kowalski, Crocker & Kowalski, 1997) was used to establish overall PA levels. The PAQ-A has been validated for use with the current population (Janz, Lutchy, Wenthe, & Levy, 2008; Kowalski, Crocker & Faulkner, 1997).

Psycho-Social Variables

Table 7.3 details the instruments that were used to measure the psychosocial variables related to PA.

Table 7.3: Psychosocial Measurements evaluated pre and post intervention

Variable	Reference or validation of reference
Social-Support for PA	Prochaska, Rodgers and Sallis (2002)
Intrinsic Motivation Inventory Subscales:	
• Perceived Choice	Deci, McAuley, Duncan and Tammen (1987)
• Interest and enjoyment	
• Perceived Competence	
• Effort/Importance	
Self-efficacy for PA	Garcia, Penderi, Antonakos and Romis, (1998)
Self regulatory self-efficacy	McAuley and Muhlko (in Duda) Measuring Exercise Related Self-Efficacy. i.e from guidelines produced by Bandura (1977)
Stage of change	Prochaska, Donovan, D'Arcy, Holman and Giles Corti (1998)
Perceived Barriers to PA/Decisional Balance	Marcus and Owen (1992)

Stage of change

Chi-square analyses of the proportion of participants in each stage of exercise behaviour change were conducted to reveal significant differences at relevant time points.

Additional Measures

Pre intervention, t-tests were used to examine differences between the control and experimental group at baseline to determine the effectiveness of randomisation. All data were checked for normality and homogeneity. The decisional balance score was removed from the data set as normality could not be found. Where necessary, data were log transformed to ensure equality of variances. However there were no differences in significance levels once data had been transformed, so original data is presented.

In order to achieve Aim 1 and compare the effects of the intervention on PA and psychosocial variables, a series of repeated measure 2 (time) x 2 (group) ANOVA's were conducted on the whole sample. In order to examine Aim 2, as to whether the intervention had a differential effect on high and low active participants, the experimental group were sub divided into those 'above' and those 'below' the mean PA score.

Following this, a series of repeated measure 2 (time) x 2 (group) ANOVA's were conducted on the data.

In order to achieve Aim 3, participants in the experimental group were sub divided into '5 weeks' and '10 weeks', a series of repeated measure 3 (time) x 2 (group) ANOVA's were then conducted.

Where required, post-hoc one-way ANOVA's and independent t-test were conducted on difference score to determine where the significant difference occurred. Estimates of effect sizes and power were calculated for the 2 x 2, 3 x 2 ANOVA's. Only the results of the interactions computed in the analysis are presented as main effects were not central to the aims of the current study.

Section Two: Pupil Validity Assessment and Researcher Case Notes

A pupil validity questionnaire (Appendix R) was developed in order to establish the effectiveness of the processes involved in the intervention. Given the early nature of this research project in the field of active-gaming and PA and in line with action research, it was deemed appropriate that consideration was given to the process of the intervention rather than simply the outcome measures. As with the previous framework presented in Study 1 (49-99), social validity is focused across three key areas: social significance of the goals set, social appropriateness of the procedures carried out and the social importance of the outcomes of the experience. As with Study 1, the researcher made a series of case notes throughout the duration of the intervention. Case notes refer to the delivery of the intervention and with reference to the future delivery of such an intervention. As with study 1, case notes are presented as excerpts from the primary researchers' reflective diary. The notes have been organised and presented around six main themes: pupil buy-in, staff buy-in, content and format of the consultation, facilities and delivery issues, and measurement and outcome issues.

Data Organisation and inductive content analysis

Questionnaire responses were collated (Appendix S) and inserted into Nvivo 6, during this time the researcher read the responses through several times in order to familiarise herself with the material and gather a general opinion of emerging themes (Crossley, 2000). The process of analysis is shown in Figure 7.5. It illustrates that after each open-ended questionnaire response was read through several times the researcher proceeded to organise the data in a way to best consider the research question and the data was

organised into themes associated with social validity. Following this data was inductively analysed by two researchers who identified and extracted ‘meaning units’ within the transcript. As with previous chapters development of a meaning unit came from definitions such as “words, sentences or paragraphs containing aspects related to each other through their content and context.” (Graneheim & Lundman, 2004, p.106) and was defined as “words or phrases that can be identified as having one meaning”. Following this, emergent data was then allocated to themes relating to positive or negative aspects of the intervention for indicative analysis. Each theme was agreed upon through discussion between researchers until consensus was met.

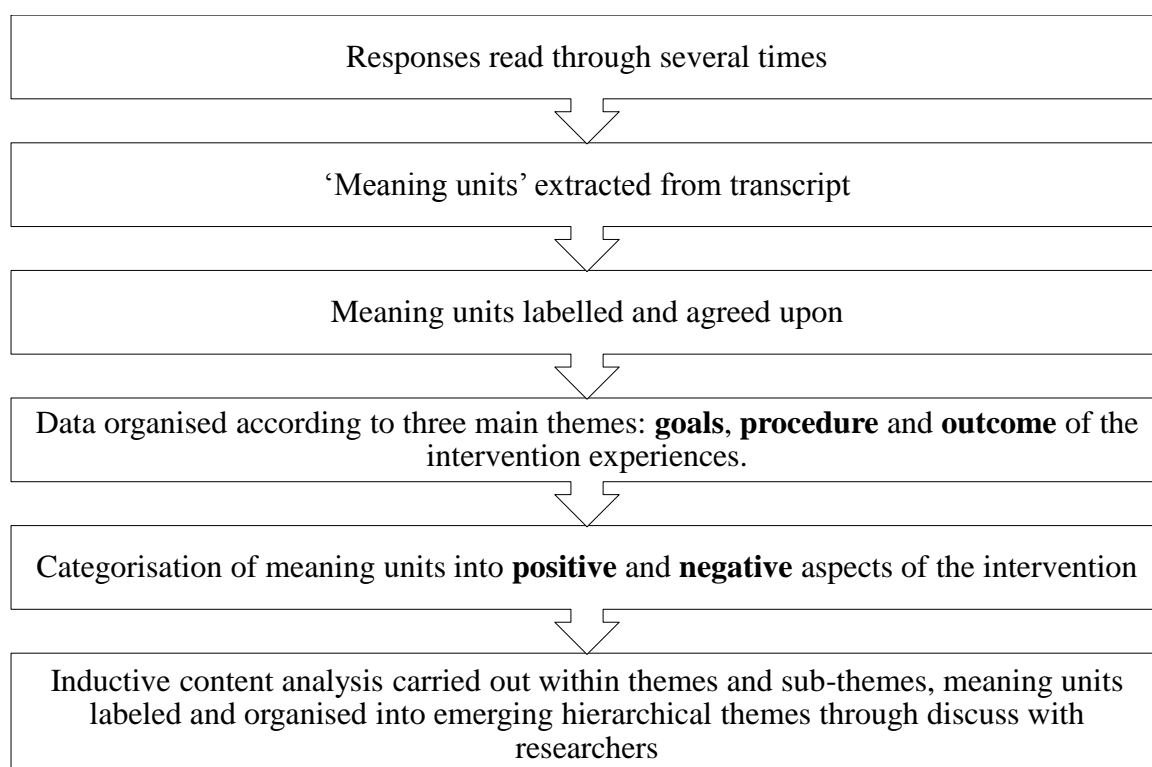


Figure 7.5: Data analysis process

7.6 Results

7.6.1 Section One: Overall physical activity and psycho-social variables

Figure 7.8 details the trial profile summarising participant flow and numbers throughout the study. In some instances, participants failed to complete individual questions in the questionnaire, but were retained in the study to include the additional data collected. There were no significant differences between the experimental and control conditions on the PA score or any of the psycho-social variable scores after randomisation at baseline.

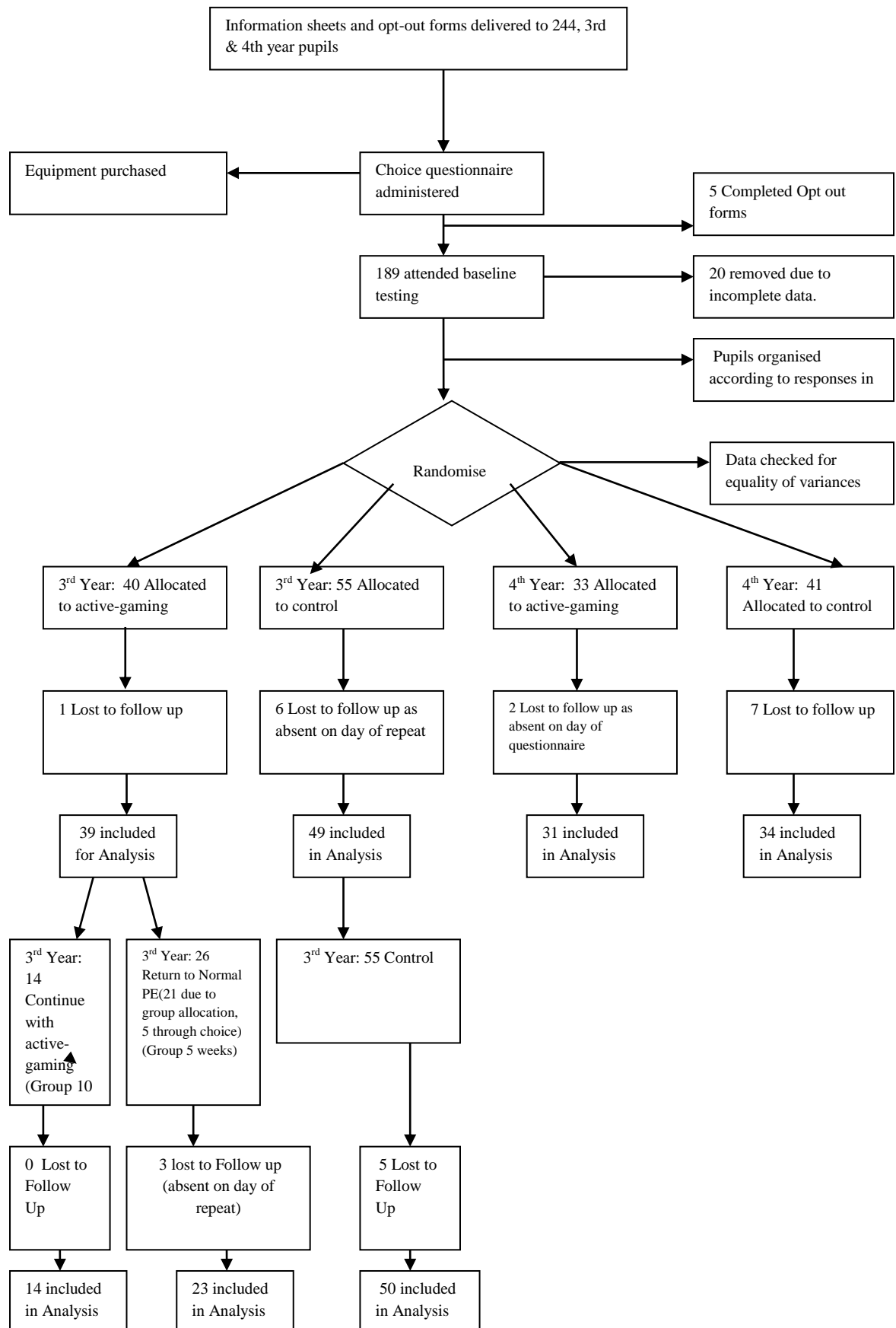


Figure 7.6: Study 4: Profile

Aim 1: Evaluation of a 5 week intervention on the whole population

Stage of Change

Table 7.4 illustrates the proportion of participants in each stage of change pre and post intervention for the control versus experimental group.

Table 7.4: Proportion of participants in each stage of behaviour change pre and post intervention for the control and experimental conditions

Proportion of participants in each stage of behaviour change, pre and post intervention.				
Stage	Pre		Post	
	Experimental (n=68)	Control (n=74)	Experimental (n=68)	Control n=(74)
Pre-contemplation	8%	5.5%	2.7%	6.2%
Contemplation	18.7%	11%	18.9%	24%
Preparation	25.3%	33%	35.1%	35.4%
Action	17.3%	12.1%	8.1%	8.3%
Maintenance	30.7%	38.5%	35.1%	26%

Chi-square analysis of the proportion of participants in each stage of exercise behaviour change revealed no significant difference between the experimental and control group at baseline ($X^2=4.38$, $df=4$, $p=0.36$) or post intervention ($X^2=2.76$, $df=4$, $p=0.6$).

Physical activity and psycho-social variables

Table 7.5 presents data relating to Aim 1: mean results from pre to post intervention between the control and experimental groups.

Table 7.5: Mean results and standard deviations pre and post intervention for the control and experimental conditions

Measurement	Condition	Pre	Post
PA			
(maximum score = 5)	Control (n=78)	2.32 (0.61)	2.37 (0.64)
	Experimental (n=64)	2.41 (0.74)	2.52 (0.64)
Self Regulatory Self Efficacy			
(maximum score = 4)	Control (n=83)	2.61 (0.61)	2.67 (0.61)
	Experimental (n=69)	2.60 (0.62)	2.64 (0.55)
Self Efficacy			
(maximum score =10)	Control (n=86)	6.14 (2.59)	6.11 (2.63)
	Experimental (n=73)	6.42 (2.69)	6.03 (2.63)
Family Social Support			
(maximum score =5)	Control (n=84)	2.50 (0.89)	2.48 (0.96)
	Experimental (n=71)	2.64 (1.04)	2.39 (0.89)
Peer Social Support			
(maximum score =5)	Control (n=83)	2.12 (0.59)	2.23 (0.70)
	Experimental (n=68)	2.16 (0.81)	2.20 (0.73)
Interest and Enjoyment			
(maximum score = 7)	Control (n=79)	4.29 (1.40)	4.34 (1.41)
	Experimental (n=66)	4.56 (1.36)	4.60 (1.41)
Effort and Importance			
(maximum score = 7)	Control (n=79)	4.67 (1.38)	4.53 (1.40)
	Experimental (n=70)	4.83 (1.20)	4.61 (1.35)
Perceived Competence			
(maximum score = 7)	Control (n=82)	4.30 (1.30)	4.28 (1.17)
	Experimental (n=65)	4.35 (1.25)	4.50 (1.07)
Perceived Choice			
(maximum score = 7)	Control (n=81)	4.09 (1.42)	3.98 (1.59)
	Experimental (n=60)	4.30 (1.54)	4.24 (1.54)

Additional analysis

There were no significant interactions on any of the following measurements: PA, self regulatory self efficacy, self efficacy, family social support, peer social support or any of the IMI subscales.

Aim 2: Evaluation of the effectiveness of a 5 week intervention on a sub-group of the sample (experimental group above and below mean PA).

Girls were grouped according to their PAQ-C score at baseline. Those identified as below the mean score are subsequently referred to as 'low' active (n=32) and those above the mean as 'high' active (n=37).

Stage of Change

Table 7.6 illustrates the proportion of high and low active participants in the experimental condition pre and post intervention in each stage of change.

Table 7.6: Proportion of participants in each stage of behaviour change pre and post intervention according to physical activity level

Stage	Pre		Post	
	Experimental	Experimental	Experimental	Experimental
	Low (n=29)	High (n=35)	Low (n=29)	High (n=35)
Pre-contemplation	12.5%	5.4%	6.5%	0
Contemplation	31.2%	10.8%	29.0%	10.8%
Preparation	40.6%	10.8%	54.8%	13.5%
Action	9.4%	21.6%	0%	16.2%
Maintenance	6.2%	51.4%	9.7%	59.5%

As was anticipated, Chi-square analysis indicated significant differences between these groups pre and post intervention. Chi-square analysis conducted between low active girls in the experimental condition and low active girls in the control group, identified there was no significant difference between the groups before the intervention ($X^2=5.8$, $df=4$, $p=0.21$) or after 5 weeks ($x^2=4.2$, $df=4$, $p=0.37$).

Physical activity and psycho-social variables

Table 7.7 presents the mean data from pre to post intervention (5 weeks) between the low and high active experimental groups.

Table 7.7: Mean results and standard deviations pre and post intervention according to physical activity level

Measurement	Condition	Pre	Post
PA	Experimental (low) (n=29)	1.76 (0.33)	2.08 (0.44)*
(maximum score = 5)	Experimental (high) (n=35)	2.95 (0.53)	2.89 (0.55)
Self-Regulatory SE	Experimental (low) (n=29)	2.27 (0.51)	2.32 (0.40)
(maximum score = 4)	Experimental (high) (n=35)	2.88 (0.59)	2.91 (0.54)
Self Efficacy	Experimental (low) (n=31)	4.99 (2.72)	4.30 (2.18)
(maximum score =10)	Experimental (high) (n=36)	7.79 (2.00)	7.57 (2.02)
Family Social Support	Experimental (low) (n=30)	2.11 (0.95)	1.97 (0.78)
(maximum score = 5)	Experimental (high) (n=35)	3.14 (1.07)	2.79 (0.84)
Peer Social Support	Experimental (low) (n=29)	1.73 (0.81)	1.77 (0.63)
(maximum score = 5)	Experimental (high) (n=33)	2.57 (0.65)	2.55 (0.59)
Interest and	Experimental (low) (n=27)	4.02 (1.31)	4.37 (1.42)
Enjoyment	Experimental (high) (n=33)	4.92 (1.36)	4.81 (1.43)
(maximum score = 7)			
Effort and Importance	Experimental (low) (n=29)	4.26 (1.24)	4.51 (1.36)*
(maximum score = 7)	Experimental (high) (n=35)	5.29 (1.05)	4.73 (1.44)
Perceived Competence	Experimental (low) (n=29)	3.72 (1.13)	4.22 (1.00)*
(maximum score = 7)	Experimental (high) (n=32)	4.91 (1.14)	4.74 (1.12)
Perceived Choice	Experimental (low) (n=25)	3.72 (1.60)	3.99 (1.39)
(maximum score = 7)	Experimental (high) (n=30)	4.73 (1.45)	4.54 (1.68)

**Denotes a significant difference pre and post intervention*

Physical activity

There was a significant interaction between group and time ($F(1,62) = 5.50, p < 0.01$), with a small effect size of 0.17. A post hoc independent samples t-test conducted on the difference score identified that there was a significant difference in PA behaviour between low active participants as compared to high active participants, ($t = 3.56, df 62, p < 0.01$). Those below the mean increased their PA whereas those high active decreased on their PA score.

Additional analysis

There was no significant interaction on the following measures: self-regulatory self efficacy, self efficacy, family social support or peer social support. There were no significant interactions for either perceived choice or interest and enjoyment in the Intrinsic Motivational Questionnaire. There were however significant interactions for effort and importance and perceived competence.

Effort and importance

There was a significant interaction between group and time ($F(1,62) = 5.15, p < 0.05$), with a small effect size of 0.07. A post hoc independent samples t-test indicated that low active participants increased their score significantly more than high active participants ($t = 2.27, df 62, p < 0.05$).

Perceived competence

There was a significant interaction between group and time ($F(1,59) = 4.18, p < 0.05$), with a medium effect size of 0.67. A post hoc independent samples t-test indicated that low active participants increased their score significantly more than high active participants ($t = 2.04, df 59, p < 0.05$).

Aim 3: An evaluation of the effectiveness of a 10 week intervention on a sub-group of the population (S3 only).

Stage of change

Table 7.8 illustrates the proportion of experimental participants in each stage of change at each time point.

Table 7.8: Proportion of participants in each stage of behaviour change pre and post intervention across three time points for experimental groups A and B

Stage	Time 1		Time 2		Time 3	
	Experimental a N=22	Experimental b 14	Experimental a N=22	Experimental b N=14	Experimental a N=22	Experimental b
Pre-Contemplation	11.5%	7.1%	8%	0	8.3%	0%
Contemplation	23.1%	21.4%	20%	28.6%	29.2%	35.7%
Preparation	23.1%	35.7%	32%	50%	25%	42.9%
Action	19.2%	14.3%	8%	7.1%	0%	7.1%
Maintenance	23.1%	21.4%	32%	14.3%	37.5%	14.3%

Chi-square analysis indicated that there were no significant differences between those who took part in the intervention for 5 weeks or 10 weeks at baseline ($X^2=8.53$, $df=4$, $p=0.93$), after 5 weeks ($X^2=3.27$, $df=4$, $p=0.51$), or after 10 weeks ($X^2=5.5$, $df=4$, $p=0.24$),

Additional Analysis

This section presents the results from time point 1 (baseline), time point 2 (5 weeks) and time point 3 (10 weeks) for those in group ‘5 weeks’ (a) ‘10 weeks’ (b) as illustrated in Table 7.9.

Table 7.9: Mean of each of the measurements across three points for experimental groups A and B

Measurement	Condition	Time 1	Time 2	Time 3
PA (maximum score = 5)	Experimental a (n=22)	2.40 (0.69)	2.49 (0.62)	2.47 (0.77)
	Experimental b (n=11)	2.13 (0.59)	2.44 (0.48)	2.44 (0.63)
Self-Regulatory Self-Efficacy (maximum score = 4)	Experimental a (n=23)	2.63 (0.60)	2.67 (0.63)	2.81 (0.59)
	Experimental b (n=13)	2.48 (0.52)	2.38 (0.25)	2.43 (0.47)
Self Efficacy (maximum score = 10)	Experimental a (n=23)	5.46 (0.90)	6.03 (2.52)	6.27 (2.78)
	Experimental b (n=14)	5.73 (0.55)	5.41 (2.42)	5.27 (2.17)
Family Social Support (maximum score = 5)	Experimental a (n=22)	2.89 (1.01)	2.63 (0.89)	2.70 (0.75)
	Experimental b (n=14)	2.46 (0.94)	2.36 (0.83)	2.17 (0.90)
Peer Social Support (maximum score = 5)	Experimental a (n=22)	2.19 (0.86)	2.24 (0.81)	2.17 (0.80)
	Experimental b (n=14)	2.24 (0.81)	1.97 (0.69)	1.90 (0.66)
Interest and Enjoyment (maximum score = 7)	Experimental a (n=22)	4.35 (1.36)	4.61 (1.61)	4.21 (1.54)
	Experimental b (n=14)	4.44 (1.11)	4.10 (1.42)	3.65 (1.45)
Effort and Importance (maximum score = 7)	Experimental a (n=22)	4.63 (1.17)	4.70 (1.54)	4.26 (1.40)
	Experimental b (n=11)	4.69 (1.10)	4.09 (1.08)	3.85 (1.32)
Perceived Competence (maximum score = 7)	Experimental a (n=20)	4.31 (1.30)	4.65 (1.21)	4.48 (1.11)
	Experimental b (n=11)	4.03 (1.08)	4.12 (0.68)	4.05 (1.32)
Perceived Choice (maximum score = 7)	Experimental a (n=20)	4.05 (1.70)	4.42 (1.81)	4.24 (1.77)
	Experimental b (n=11)	3.81 (1.15)	3.84 (0.94)	3.40 (1.16)

Analysis

There were no significant interactions for any of the variables assessed.

7.6.2 Section Two: Pupil Validity Assessment and Researcher Case Notes

Overview: Qualitative Results

The key aim of this section of the study was to examine participants' experiences of an SCT based active-gaming intervention from a social validity perspective, through a pupil validity questionnaire. Each theme identified can be interpreted as an experience of the intervention that will be considered firstly, from an evaluative perspective and secondly, for the development of potential future investigation in this area.

The results presented are the collated responses of 70 social validity questionnaires completed. In each instance the data was firstly organised in accordance with the themes proposed by the social validity framework: goals, procedure and outcome illustrated by Figure 7.7. Findings are presented in line with these three main themes. Figure 7.8 provides a key to each of the diagrammatical representations of the results.

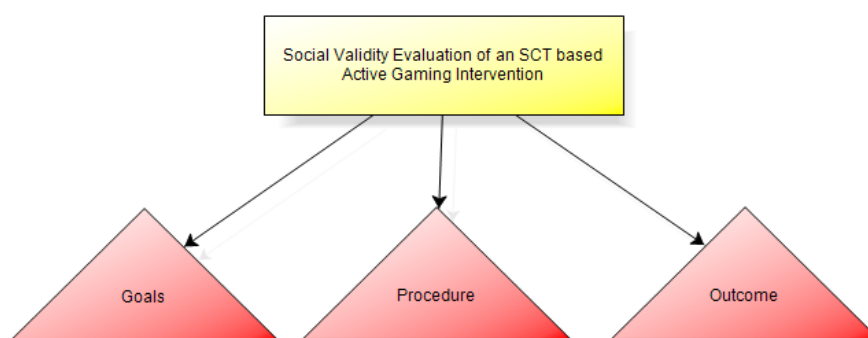


Figure 7.7: Components of social validity for organisation

Following initial organisation, data were then organised according to positive and negative aspects of the intervention resulting in sub-themes. Data was then inductively analysed, whereby first order themes were developed by clustering meaning units with similar themes. Second and third order themes then emerged from clustering first preceding order themes with a similar meaning.

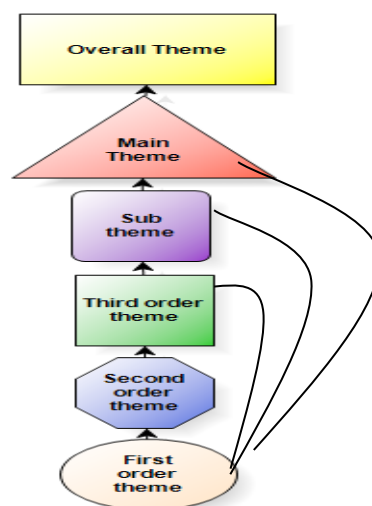


Figure 7.8: Diagram Key: Development of themes

The inductive analysis of social validity data yielded 42 first order themes, 8 second order themes, 4 third order themes, 3 sub themes, and 3 main themes which merged into the overall theme: evaluation of an SCT active-gaming intervention. In some instances, first order themes were directly linked to the third order themes, sub themes or main themes. The results are presented in text format in accordance to these, and quotes are used to provide further meaning and pseudonyms are used to ensure pupil confidentiality and to bring the data ‘to life’.

Quantitative Results

Likert Questions

The pupil validity questionnaire contained questions on a Likert scale of 1 to 7. 1 represented ‘not at all’ and 7 represented ‘very much’. The mean responses to the appropriate Likert scale questions are detailed in each of the tables (table 7.10, 7.11 and 7.12) at the end of each of the qualitative results sections: Goals, Procedures and Outcomes.

Main Theme: Goals

In relation to social validity, goals are usually assessed in relation to two factors. Firstly, importance, which is concerned with the justification for working towards a particular treatment goal. Secondly, acceptability which is concerned with societies (in this case the participants’) opinion on the desirability and worthwhile nature of the goal. In accordance with this, this theme emerged in relation to comments that referred to participant’s recognition that the goals of the intervention were important ones to them. Figure 7.11

illustrates that there were 6 first order themes and 2 second order themes that emerged into the main theme: Goals. There were 6 negative comments and 14 positive comments made in relation to the goals of the intervention.

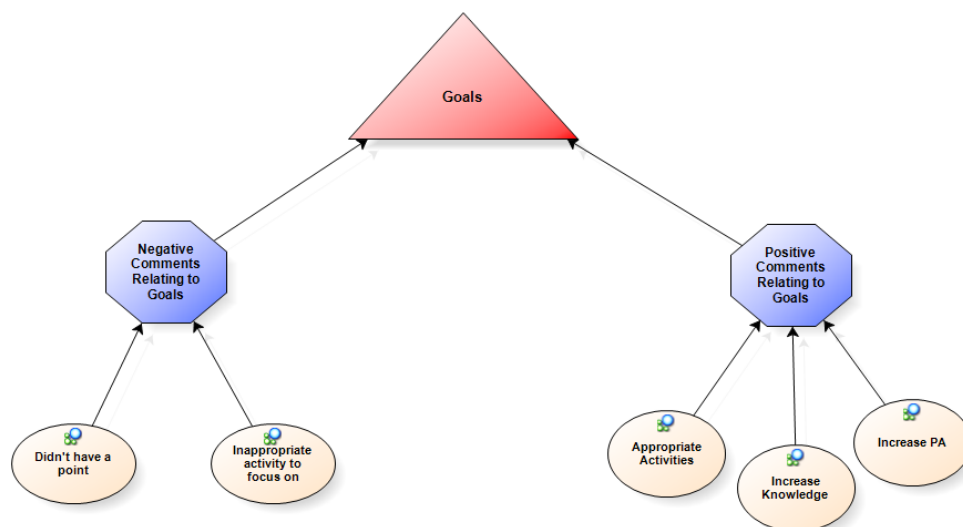


Figure 7.9: Main Theme: Goals

Hierarchical structure of Second order theme: Negative Comments Goals

This theme is defined as negative comments referring to the importance and acceptability of the intervention. It emerged from 2 first order themes and merged directly into the main theme.

Didn't have a point

This theme is defined as participants' comments that they did not think the project had a clear point; it emerged from participants' comments relating to their lack of understanding of the purpose of the intervention. For Emily, she felt that she didn't understand what she was doing and the reasons for taking part: "No, it could be improved if it was easier to understand and if we actually knew what we were supposed to be doing and why we are doing it." Similarly, Kate felt that she has not had an opportunity to contribute to the goals of the intervention: "...they didn't ask what you would like to get out of the project." For Kate, she felt that she had not had an input into the goals and so there is a possibility the intervention was not relevant for her.

Inappropriate activity to focus on

This theme emerged from participants' comments that they did not feel active-gaming was an appropriate medium to deliver the intervention. Rachel commented that she already used the wii and so the introduction in PE was something they thought was pointless: "No, I have one at home (a wii) so it was kinda pointless wasting a good period of PE to do something that I could have done at home anytime." Another participant, also noted her concerns about the wii as a means for delivering the intervention: "No because I thought that we did more work and more active in normal PE as with the wii it took ages to set up and stuff." Both Rachel and Julie did not appreciate the wii as a means for the intervention to be delivered.

Hierarchical structure of Second order theme: Positive Comments Goals

This theme is defined as positive comments relating to the importance and acceptability of the goals of the intervention, it emerged from three first order themes.

Appropriate Activities

This theme is in contrast to the previous theme and refers to positive references towards active-gaming as an appropriate activity for the intervention to utilise as illustrated by the following quote from Jane: "Yes, playing the wii was good I enjoyed it." Lucy, also intimated that she felt the wii was a useful way to deliver the PA component of the intervention: "Yes, I enjoyed it, it was worthwhile because I didn't enjoy PE before I did this." For Lucy, enjoyment of the activity meant that she enjoyed the active gaming sessions more than traditional PE.

Increase knowledge

This theme emerged from participants' positive comments relating about the acceptability of the purpose of the intervention to increase PA knowledge. Pupils such as Rachel felt that time spent in the workshops learning and talking about PA was time well spent: "Yes, the time we spent talking about the above issues were very useful and there are something's we can incorporate into our daily routines and I felt I wasn't wasting my time going there. " Kate also reported increasing knowledge about her PA behaviour and how she could make changes to her current behaviour: "Yes it made me realise how little activity I done and what changes needed to be made (raised my awareness)." Comments from these participants illustrates that the goal of increasing knowledge appears to be acceptable to some of the girls.

Increase PA

A key goal of the intervention was to increase PA behaviour; this theme refers to participants' comments that increasing PA is an acceptable and important goal to them. When asked if the intervention focused on areas of interest to them, both Rhona and Rachel felt that it did: Rhona: "Yes, it encouraged me to be more active out of school." Rachel: "Yes, it inspired me to exercise more (in PE or walking to school more) and it was fun." For both these participants the intervention's goal of increasing overall PA was acceptable.

Quantitative Results

Likert Questions

Table 7.10 presents the Likert responses relating to the goals of the project.

Table 7.10: Mean Likert responses related to the goals of the intervention (Scale 1 – 6)

Social Validity Level and Question	Mean	Standard Deviation
Were you interested in increasing your PA levels in PE?	4.45	1.71
Was the project's aim of increasing your OVERALL PA of interest to you?	4.8	1.64

The mean response to the Likert questions relating to the goals of the intervention indicate that, in general, participants' were accepting of the goals and felt that they were important to them.

Main theme: Procedure

The theme procedure can be defined as the acceptability of the procedures adopted throughout the intervention. This referred to the participants' experiences of the active gaming sessions and PA workshops. Figure 7.10 illustrates that there were 35 first order themes that emerged into 4 second order themes, that developed into 4 third order themes, and 2 sub themes. There were 269 positive meaning units relating to the procedure and 98 negative meaning units.

It can be seen in figure 7.10, that themes associated with the active-gaming component of the intervention emerged primarily into the theme environmental and this incorporates both the social and physical environment. The social environment refers to the organisation and make up of the participants, or the intangible aspects of the PA class; for example reference to the mood or atmosphere of the class. In line with previous definitions of the physical environment this theme is defined as references to the material objects and facilities present in an environment and includes references to the actual PA being conducted.

Figure 7.12 also illustrates that data emerged into individual correlates and this data includes comments about both the active gaming sessions and the PA workshops. Individual correlates include psychological, cognitive and emotional factors previously identified as associated with PA behaviour (Sallis et al., 1999). Other data emerged into themes associated with the workshop component alone and these were not divided into individual and environmental components.

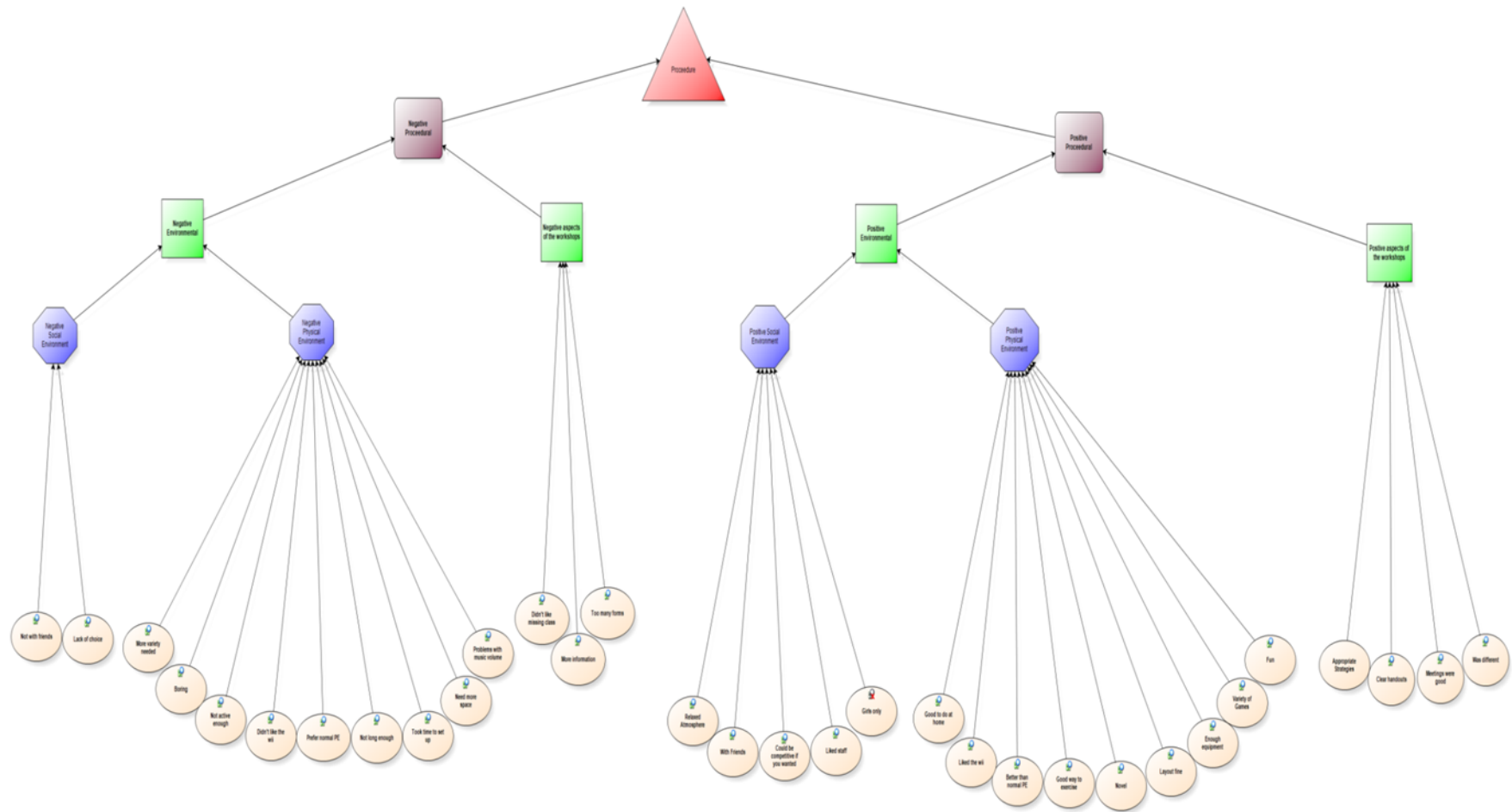


Figure 7.10: Main theme: Procedure.

Hierarchical structure of sub-theme: Negative Procedure

This theme is defined as negative comments relating to the procedural aspects of the intervention. In line with the social validity framework, this means that themes emergent here were perceived by participants as unacceptable aspects of the procedure adopted for the intervention.

Negative Environment

Negative social environment

This theme is defined as negative references to the organisation and make up of the active-gaming class and the more intangible aspects of the class, such as mood and atmosphere. There were 2 first order themes which emerged into the third order theme negative social environment.

Not with friends

This theme is defined as pupils' comments that they were not able to take part in the active-gaming class with friends as described by Louise: "I would have liked to be in a class with some of my friends and I felt a bit self conscious doing some of the activities in front of some of the other girls." For Louise, it was suggested that not having many friends in the class made her uncomfortable.

Lack of choice

This theme emerged in relation to comments pupils made about a lack of choice available in the intervention. For example one participant, Heather, highlighted that she found the workshop component of the intervention useful, but she felt that she should have had a choice about the activity: "Yes it was good the classes with work books were useful but it would be better if you got a choice in doing the wii or not." For Heather, having a choice about doing the wii for PE something she felt was important. Another participant, Angela, reported that she felt that as the intervention progressed the element of choice was taken away from her: "It was good at the start but after a while it got boring and started to feel like we were being forced to do it." In Angela's opinion, she felt that it was not her choice to take part in the intervention at the latter stages. Finally, Rose reported that there was a generic lack of choice in the intervention: "No, they wouldn't like it, too little choice in what we did." For Rose, she reported that she would not recommend the activity to other because there was too little choice.

Hierarchical structure of second order theme negative physical environment

This theme is defined as any negative comments relating to the facilities, materials presented in the class and to the actual PA (the wii). There were 9 first order themes that emerged into the second order theme.

More variety needed

This theme refers to more variety needed in relation to the actual PA pursuit: active gaming. Several pupils reported that they would have liked more variety in the active-gaming sessions as illustrated by Kate's response: "They only had a small selection of games." Similarly, Anna felt that there could have been more 4 player games on offer: "Maybe have more 4 players than just the just dance game" This was in addition to several comments that "different games" and "more variety of games" could have been provided.

Boring

Several participants reported that they found the active-gaming sessions boring or that it got boring after a period of time. Catriona felt that the continuation of the same games was boring: "...different games, the same ones got boring." For Jenna, she reported that she would not recommend the intervention because she felt it was too boring: "No, it was boring." Other participants intimated that they did not find the intervention boring to begin with, but towards the end they did: "No, it gets a bit boring. It was OK at the beginning." For, participants such as Anna their interest in active-gaming decreased over time.

Not active enough

This theme refers to the perceived lack of energy expenditure carried out by participants while taking part in active-gaming sessions. This is illustrated by pupils such as Kate who reported that because there wasn't any running required during the active-gaming sessions, she did not feel physically tested: "I wasn't really challenged, there wasn't really any running." This is reflected in Rose's response: "No, I would have like to have gotten a better workout." For Rose, the wii did not provide her with enough physical exertion. Similarly, Charlotte felt that taking part in a sport is better than active-gaming: "I would say that an actual sports activity is more beneficial than the wii."

Didn't like the wii

This theme can be defined as pupils' references to disliking the active-gaming on offer: The wii. Some participants did not enjoy the wii, for example, Mary reported that she did not like the wii: "Nothing, I didn't like doing the wii." Similarly Sam also reported a dislike for the activity, but her response was slightly stronger: "Maybe do something more useful, hated playing the wii, was very unenjoyable." It is apparent that the wii was not the activity of choice for some participants and this had an impact on their enjoyment levels of the intervention.

Prefer normal PE

This theme can be defined as pupils' comments that they preferred 'normal' or original PE to active gaming. This is demonstrated by Jude who felt that she did more work in normal PE: "I thought that we did more work and more active in normal PE." This is reflected in Gillian's response: "It didn't really increase my activity level during PE. I would have been more active playing basketball or volleyball." Both Gillian and Jude felt that they would be more active during normal PE session. Similarly, Sarah felt that she would have preferred to have worked on more traditional activities in PE: "No, I would have liked to work on actual games like running and basketball." It is apparent that for some participants taking part in normal PE would have been preferable, and arguably more advantageous, than taking part in active-gaming.

Not long enough

It was reported by some pupils that they felt that the length of time of the sessions was not long enough. For example, Julie reported that she found the time too short: "I didn't feel an hour was long enough to get active on the wii." For Julie, one period of active-gaming was not long enough for her. For Jude, it was a case that she would have preferred more than one active-gaming session a week: "...maybe have more active lessons..." For both Julie and Jude, the exposure to active-gaming was not perceived as enough

Took time to set up

This theme emerged from pupils comments relating to the length of time it took for the active-gaming sessions to be set up each period as detailed by Catriona: "Yes, at the start of each lesson it took a while to get started..." For Catriona, starting the lesson faster would have improved the active-gaming experience for her.

Need more space

Several pupils reported that they found the classroom in which the active-gaming sessions took place too small and this was the most commonly reported complaint about the physical aspect of the active-gaming environment. Emma reported that the active-gaming session could be improved if there was more space: “More space would be good.” Similarly Claire felt that the main aspect of facilities and materials provided for the intervention to be improved upon was space: “There were lots of wii machines and good size TV’s but there could have been more space.” The view that the space provided for active-gaming was too small was also shared by Yvonne: “It was very cramped doing it in a small room.” Overall, many pupils reported that the room in which the active-gaming took place was not big enough and the intervention could have been improved by having more space.

Problems with music volume

This theme is defined as pupils’ references to problems with the music volume. In some instances pupils such as Sarah felt that the music was too loud: “the room got too noisy with all the wiis on and the volume turned up.” In contrast, other pupils such as Louise felt that the music was not loud enough. “Maybe you could make the music louder on the wii’s sometimes it was hard to hear them.” It is apparent that there are problems with the sound settings of the active-gaming consoles, but sometimes personal preferences may play a role in this.

Hierarchical structure of third order theme Negative Aspects of the workshops

Didn't like missing class

This theme emerged when pupils commented that they did not like missing class to attend the PA workshop. Beth reported that she thought the project was OK, but didn’t like missing class to attend workshops: “It was OK, didn’t get much choice though. I didn’t appreciate being pulled out of class so close to my exams.” For Beth, she thought it was negative that she missed exam preparation to attend a workshop. This was a view shared by Rachel: “I could have used the time that I was taken out of class for my exam work instead.” Rachel felt that her time could have been better spent in class working towards her exams.

More information

This theme emerged from some pupils' comments that they would have liked more information to be available to them. This is illustrated by Rhona's comment relating to her satisfaction with the project: "No, more fitness ideas". For Rhona, the project could have been improved if she had been provided with more ideas as to how she could improve her fitness. Similarly, Ruth felt that the intervention could have been improved with more access to the researcher: "There could be more days that people could see you." For Ruth, having the option to utilise the researcher and her knowledge more was something she saw as potentially beneficial.

Too many forms

It emerged that some participants felt that there was too much paperwork to complete. For example, Jade felt the intervention could be improved if there were: "less forms to fill out." Also sharing this opinion was Lucy who felt that: "It was a very good project to do but the paperwork could have been shortened down." It was suggested that some participants would have preferred less paperwork, but it is not explicitly clear from the participants' answers if they are referring to the questionnaires or the worksheets used in the PA workshops and this is something that requires further clarification.

Hierarchical structure of sub-theme: Positive procedure

This theme emerged in relation to positive comments associated with the procedures adopted for the intervention. There were 20 first order theme that developed into 2 second order themes, which developed into 3 third order themes which then emerged into the sub theme positive procedure.

Hierarchical structure of third order theme Positive Environment

This theme emerged in relation to comments from participants regarding the positive aspects of the active-gaming environment. This theme emerged from two second order themes.

Hierarchical structure of second order theme: Positive Social Environment

A positive social environment is defined as positive reference to the make up and organisation of the class and the mood and atmosphere of the class. This theme emerged from 7 first order themes.

Relaxed atmosphere

This theme is defined as reference to the active-gaming session as relaxed. Some pupils reported that they liked the active gaming sessions because of the atmosphere in the class. Suzie reported that she felt the atmosphere of the class was one which she enjoyed: “Yes it was very relaxed and laid back.” This opinion was also illustrated in a comment from Sarah: “Yes, I liked how it was quite relaxed and how people weren’t pressured” Similarly, Kirsty reported that she enjoyed a lack of pressure in the active-gaming class: “Yes, we got to play the wii with not that many people so I didn’t feel pressured to do well.” Some pupils felt that the active-gaming class was relaxed and as a result they did not feel under pressure and this was viewed positively.

With friends

Several pupils reported that they appreciated being able to take part in the active-gaming sessions with friends. For Kirsten it made the activity fun: “Yes, it was fun to do with friends.” Having friends in the class can be seen as a positive for Kirsten. Jessica also reported having friends in the active-gaming classes as something she enjoyed about the intervention: “Yes what I like about the project was that it can be suitable for all ages that your friends were with you and you could do something different each week.” For Jessica, there were several aspects of the intervention she liked and having her friends there was one of them.

Could be competitive if you wanted

One pupil, Andrea, reported positively on the opportunity to make the active-gaming sessions competitive if they wanted to: “I thought it was good how scoreboards for just dance were put on the wall so if you wanted to put your score up you could.” Andrea, thought that having this option was a positive aspect of the intervention.

Liked staff

Several participants reported that they liked the personnel delivering the intervention. For example, Catriona reported positively about the primary researcher: “Joan was really nice and helpful.” This was a view shared by Rhona: “Joan was very helpful and made sure everyone settles in nicely and helped carry out the tasks.” For both Rhona and Catriona and other participants the behaviours and characteristics of the staff were viewed as positive aspects of the intervention.

Girls only

The active-gaming sessions were made up of girls only and this was received positively by some participants, as exemplified by Jade: “I liked all the wiis and the fact it was only girls.” No pupils suggested that the project could have been improved by the inclusion of boys into the class.

Hierarchical structure of second order theme Positive Physical Environment

This theme refers to positive comments relating to the facilities and materials present in the active-gaming sessions and the actual active-gaming activity. There were 8 first order themes.

Good to do at home

Some participants liked active gaming as it was transferable to their home. Paula liked the activity because she could take part in it in her own home: “Yes, because it’s easy to do at home.” Similarly, Fiona felt that taking part in the wii in school encouraged her to use the wii she had at home: “Yes, it made me want to go on the wii at home more.” For participants the transfer of the activity from school to home was seen as a positive aspect of the intervention.

Liked the wii

A large number of participants reported that they enjoyed the activity on offer. Some of the participants reported that a positive aspect of the intervention was that they “liked the wii” and others provided positive feedback regarding specific games on offer. For example, Julie reported that she enjoyed Just Dance: “Use the Just Dance games, they are really good!” Overall there were a number of positive references to the wii and particular games used during the intervention.

Better than normal PE

This theme emerged from participants’ comments that they preferred the active-gaming sessions to more traditional PE. Rose reported that she now enjoys PE as a result of the activity on offer: “Yes, I enjoyed it, it was worthwhile because I didn’t enjoy PE before I did this.” Others simply reported that it was “better than normal PE”. For other participants, they felt that they worked better during active-gaming than during normal PE, as illustrated in Jane’s response: “Yes, I worked harder than in PE.” There were several comments indicating that active-gaming was more popular than normal PE.

Good way to exercise

This theme is defined as comments that indicate active-gaming is perceived as a good means of exercise. Fiona felt that active-gaming provided a good opportunity to exercise: “Yes it was a good chance to do some exercise.” For Louise, taking part in the active-gaming sessions was enjoyable, but she also felt she was getting some exercise: “Yes it was fun to do but it still got you moving.” Finally, there were specific references to individual games as a good source of exercise, as illustrated by Jodie: “Yes, Just dance was very active and fun.” There were several comments reporting that the wii and particular games on the wii were a good way to exercise.

Novel

This theme emerged from participants’ positive comments that the wii was a ‘different’ way of exercising. For example, Anna reported that she liked doing something novel: “I liked the fact it was something different to do I liked how I done something different instead of using equipment.” For Anna, using something different to the more typical equipment used in traditional PE was seen as a positive aspect of the intervention. This was similar to Jade: “Yes, I liked the project as it was something different than usual for PE. I enjoyed the wii sports resort.” Jade reported that she liked the intervention because it offered her something outside the norm.

Layout fine

This theme is defined as references to the layout of the class being satisfactory to participants. Rachel reported that she thought the layout of the project was good: “It was a good layout and atmosphere etc.” Similarly, Julie felt that the organisation and layout of the active-gaming class was suitable: “I thought the facilities and layout was perfect and the class organisation was really good.” Finally, in contrast to earlier comments regarding a lack of space in the active-gaming class, some pupils, such as Jennie felt that the space provided was more than adequate: “No, the TV’s and wii’s were spaced out, lots of room for you to move about.” There were several positive comments relating to the layout of the class.

Enough equipment

This theme is defined as participants’ satisfaction with the amount of equipment on offer. Sarah felt that there was a lot of equipment on offer: “They provided lots of wii and wii fit and wii games.” Similarly, Rebecca felt that the equipment on offer was more than satisfactory: “I was very impressed by the number of wii consoles, games and TV’s you provided, you did a great job, thank you!” On the whole, participants reported that there

was enough equipment provided.

Variety of games

This theme emerged in relation to participants' satisfaction regarding the variety of active-games available to them. Annabel reported that there were lots of games available to her "...get a lot of different games to play on the wii." This is supported by Kate and Rhona who reported that there were "a variety of games" and "Good choice of games" respectively. This theme contrasts to a previous theme which suggested that there was not enough variety in the games provided.

Fun

This theme is defined as pupils' comments that active-gaming was a fun and enjoyable activity to take part in, as illustrated by Carole's comment: "It was good for getting people to have fun." Carole's view about the wii being a good way for people to have fun was also shared by Lucy: "Yes, it's great fun, different things to do instead of the same boring PE games." For Lucy, the wii was fun and preferable to more traditional PE games which she found 'boring'. In general, feedback about the active-gaming sessions reported that the majority of participants found the wii fun to do.

Hierarchical structure of third order theme Positive aspects of the workshops

This theme emerged from participants' positive comments relating to the workshop-component of the intervention. There were 4 first order themes which emerged into this third order theme.

Appropriate strategies

This theme is defined as positive references to the strategies adopted by the researcher to develop understanding, enhance PA behaviour and strengthen key correlates of PA. For Catriona, delivering the intervention in an enthusiastic manner was something she responded positively to: "Yes, I thought the teenactive project was worthwhile because Joan was very encouraging and I now use my wii at home more often." The use of a PA timetable (or diary), was noted by Shona as being something that helped motivate her to do more PA: "Yes, I think it was worthwhile because I started doing more PA after we done our diaries in the meeting." Finally, promoting PA as something that can be fun and enjoyable was a goal of the intervention and participants such as Ruth felt that this was an appropriate strategy to adopt: "Yes, because it shows that is fun." Overall, there were

several positive comments that suggested that the strategies adopted to achieve the goals of the intervention were acceptable to participants.

Clear handouts

This theme is defined as positive references to the clarity of the handouts given in the PA workshops. Rose felt that the handouts provided her with a comprehensive plan as to what she was doing: “Yes, on the handouts it explained clearly as to what we would be doing.” As well as helping pupils understand what the project was about, some pupils, such as Ruth felt that they played a useful role in helping to assess PA levels: “Yes the handouts were useful to assess your PA.” In general, feedback related to the quality of the handouts provided was positive.

Meetings were good

This theme is defined as pupils’ comments that the meetings were ‘good’. There were several positive comments relating to the workshops as demonstrated by Louise’s comment: “I thought the meetings were good and found out interesting stuff I didn’t know.” For Louise, she viewed the meetings positively and felt she learnt from them. Similarly, Isla had a positive view point about the workshop: “I thought it was a very good project and it helped me to plan my PA better.” For Isla, the project was helpful in assisting her in developing her PA plans. Response to the workshops was generally positive: “Yes they take it by stage by showing what could happen they try to tell you what to do and what not to do. Teenactive tells you how to increase them and gives support on how to overcome the problems it was very good and time well spent.”

Was different

Similar to the theme ‘novel’ this theme refers to participants positive comments that the PA workshops were ‘different’, this theme emerged from Jennie’s comment: “Yes, it’s a different way to do things and it’s good to learn about it so the option is always there for me.” Providing something that was different was something that Jennie appreciated.

Encouraging

This refers to participants’ comments that the PA workshops were encouraging. Pupils such as Jade felt that they encouraged her to increase her PA: “Yes, because the meeting encourages you to do more exercise and I actually have done a bit more since it started.” For Sarah, the workshops encouraged her to think about how she could increase her PA

and provided her with some impetus to develop ways of doing this: “Yes it made me think about increasing my activity levels and gave me motivation to try new things.” Other participants noted that they couldn’t recommend any alterations to the intervention, but they enjoyed being encouraged to be more active: “No there’s not really anything to recommend it was just good to be encouraged to do more activity.”

Quantitative Results

Likert Questions

Table 7.11 presents the mean Likert scale responses for the questions related to the procedural aspects of the intervention.

Table 7.11: Mean and standard deviations of the Likert responses relating to the procedures of the interventions (Scale 1 – 6)

Process Questions	Mean	Standard Deviation
I felt I understood everything that Joan explained to me	5.9	1.50
Did you find the project enjoyable?	5.34	1.60
Joan used examples and activities that were appropriate to me and my PA	5.93	1.45
I thought the people I had to take part in the project with were the right people for me to do so with	5.58	1.61
Did you feel that you had enough contact with Joan throughout the project?	5.56	1.47
I felt comfortable taking part in the project	5.76	1.55

Main Theme: Outcome

Typically outcomes are assessed for their social importance to the participants, in other words, did the degree of change represent an important improvement for the individual in question (Foster & Mash, 1999). Participants were asked to comment on the extent to which the intervention had an impact on their PA, opportunities to discuss their PA and changes to their confidence or self efficacy to be active. Figure 7.11 illustrates that there were 5 first order themes and 2 second order themes. There were 107 positive meaning units associated with the outcomes of the intervention and 15 negative meaning units elicited.

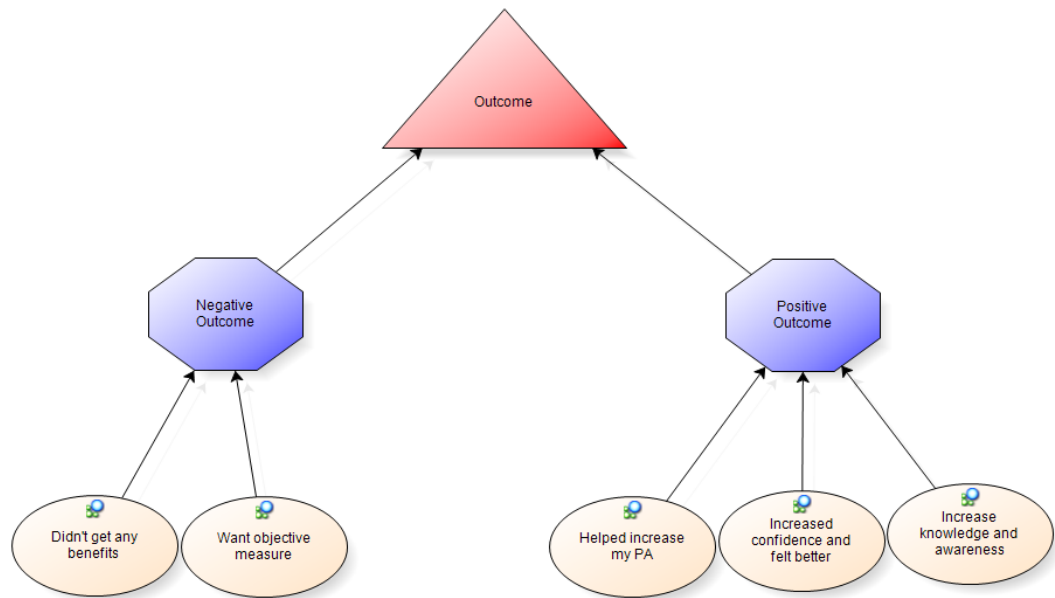


Figure 7.11: Main theme: Outcome

Hierarchical structure of second order theme Negative Outcome

This theme emerged from participants' comments that the outcome of the intervention was unsatisfactory to them.

Didn't get any benefits

This theme is defined as a participants' perception that they did not receive any benefits from the intervention. For some participants, such as Emily, she felt that the intervention did not help her: "No, I didn't think it was beneficial." This was an opinion mirrored by Jade: "No as I don't feel it helped or did anything." For Jade, she felt that there were no benefits of taking part in the intervention. For some participants such as Anna they were not looking to increase their PA and so they did not feel that the intervention benefited them: "I didn't really find the project useful as I do enough exercise anyway." For Anna, it could be suggested that neither the goals nor the outcomes of the intervention were acceptable to her as she is already active.

Want an objective measure

Some participants reported that they could not evaluate the outcome of the intervention effectively as they had no objective feedback to measure results. For Kate, she thought that she felt she required feedback from the researcher on her performance over the period of the intervention in order to assess the results of the project: "No, never received any results" Similarly, Jude felt that having more objective feedback from the researcher

would have been something she would have liked: “No, I don’t feel I benefited much from the activity and feel I would have liked to know how active I was and how this has changed them.” For both Jude and Kate, feedback on questionnaire responses may have been something they would have liked. Sally would have liked to have a pedometer to assess her PA: “No, giving us pedometers or something we could measure to encourage us to meet targets.” For Sally, using an instrument to measure her PA behaviour would have been appreciated.

Hierarchical structure of second order theme positive outcome

This theme is defined as participants’ positive comments about the acceptability of the outcomes of the intervention.

Helped increase my PA

Several participants reported that the intervention assisted them in increasing their PA. Rhona explained that she increased her PA in a number of situations: “Yes, I feel that I now do more exercise out of school and try harder in PE as well.” Carole reported that she felt she had increased her PA and learnt to fit in more activities in the face of barriers: “Yes, I managed to increase my PA and compensate when I couldn’t attend my dance classes.” In general, pupils reported positively about the intervention helping to promote an increase in PA behaviour.

Increased confidence and felt better

In addition to increasing PA behaviour the intervention sought to target personal correlates of PA. Several participants reported that they felt the intervention helped them to feel more confident about PA as illustrated in the following quote from Nancy: “Yes, because it boosted my confidence in PE and out of school.” For Nancy, she felt that the project helped to increase her confidence both in the PE environment and in PA pursuits out of school. This was also mirrored by Jessica: “I thought the project was very enjoyable and it also boosted my confidence about getting even more active.” Jessica perceived the intervention as influencing her confidence about increasing her PA even more. Finally, some pupils such as Catriona reported that the project helped her to feel better: “It helps me realise how active you can be it has helped me do more active games or stuff and it makes me feel better about myself and be able to do more stuff.” For Catriona, the intervention had several benefits but helping her to feel better about herself was one of them. Finally, Kirsten reported that the intervention helped her to feel

healthier: “Yes, I feel healthier.” For Kirsten, she felt better about her health, rather than a more generic perception of ‘feeling better’.

Rachel reported that she felt that the intervention was worthwhile because of the feelings it evoked in her: “Yes, I thought it was all worthwhile (mostly because it made me feel better).” As with Rachel, Rhona felt that feeling better was a benefit of active-gaming: “It helps me realise how active you can be it has helped me do more active games or stuff and it makes me feel better about myself and be able to do more stuff.” Having an impact on the way some individuals felt was perceived as a positive attribute of the active-gaming intervention.

Increase knowledge and awareness

The project sought to raise pupils’ awareness and increase their knowledge relating to PA and to help them develop ways in which they could increase their PA. Several pupils reported that their awareness of their PA behaviour was something that they felt was important to them, as illustrated by Hannah: “Yes, (it) increased my awareness of PA...” For Ruth, she felt that she had increased her knowledge relating to PA: “Yes I have been able to work quite hard and I feel more knowledgeable about keeping fit.” Finally, Isla reported that she felt the intervention had helped to increase her knowledge regarding over-coming barriers to PA. “Yes, it helps with getting over barriers which are preventing physical activities some days.” Overall, there was a positive response to the outcome of the project to help participants’ to increase their PA knowledge and awareness.

Quantitative Results

Likert questions

The mean responses to the Likert scale questions relating to the outcomes of the intervention are detailed in table 7.12 below. The Likert questions targeted the degree of satisfaction with the outcomes of the project.

Table 7.12: Mean and Standard Deviations of Likert responses relating to the outcomes of the intervention (Scale 1 – 6).

Outcome Questions	Mean	Standard Deviation
I would recommend the teenactive project as an option for the school to have in school to help people increase their PA	5.71	1.73
Overall, how satisfied were you with the workshops?	5.24	1.65
Did you find the project useful?	5.06	1.71
I intend to use the information I learned from the project in the future	5.03	1.67
I used the information I learned in teenactive out of school	4.58	1.84

Researcher case notes

As with Study 1 and consistent with action research methodology, the researcher made a series of case notes throughout the duration of the intervention. Case notes refer to the delivery of the intervention and with reference to the future delivery of such an intervention. As with study 1, case notes are presented as excerpts from the primary researchers' reflective diary. The notes have been organised and presented around six main themes: pupil buy-in, staff buy-in, content and format of the consultation, facilities and delivery issues, and measurement and outcome issues.

Pupil buy-in

Researcher notes were made in relation to the perceived level of engagement from pupils to the intervention, these notes were split according to the active-gaming and PA consultation components of the intervention.

Active-gaming

In the early stages of the research project, the researcher felt there was positive pupil buy-in to active-gaming as illustrated by the following excerpt: "In general pupils responded well and are enthusiastic. It is apparent, through conversations, some of the 'more active' participants would prefer to take part in normal PE." Whilst the researcher noted that the majority of pupils responded well to the intervention, girls who reported high levels of PA and enjoy traditional PE subjects were appeared less engaged in the process than their less active counterparts. However, these girls still participated in active-gaming, even if it

was not their preferred choice of activity. As the project progressed, the researcher noted a slight decline in enthusiasm from some girls:

Disappointed with some girls who were really active weeks 1 and 2 and then seem really lethargic in week 3, hopeful that they will pick up for final 2 weeks. However, still a lot of participants responding really well and very positive and enthusiastic in class.

Whilst the researcher noted that original levels of enthusiasm had decreased, the majority of participants were still engaging well with the intervention. However, those who were less enthusiastic became more distracted as the intervention continued and consistency in engagement was an issue:

Some girls appear to becoming quite distracted in class and not as enthusiastic as in the first 3 weeks. The introduction of an element of competition seems useful for some girls but not for others. Have asked girls if they would like me to purchase any additional games, but they haven't come up with any they would like to try. Many girls still progressing well and communicating with me about their activities out of school.

The researcher noted that when some pupils lost interest, the introduction of an element of competition seemed to re-engage some participants. Offering an additional choice of games did not appear to be an appropriate strategy for encouraging girls who had become detached. However, given the relatively independent nature of active-gaming, girls who were engaged were able to continue with the activity relatively undisturbed. Overall, practitioner case notes in relation to pupil buy-in were positive but highlight that not all girls bought into the concept and their level of engagement with the activity could fluctuate.

Physical activity consultations

The researcher noted that pupils engaged well in the PA consultations and seemed motivated to learn more about the health benefits of PA and to increase their PA:

The girls were really interested in finding out more about PA and links between PA and health. The majority of girls were not aware of PA guidelines prior to the

intervention and seemed surprised with the recommended amounts of PA for girls their age. In all groups where the girls reported not meeting their PA guidelines, the girls reported that they were interested in increasing their levels of PA.

It was interesting that most girls were not aware of the PA recommendations, but the researcher was encouraged by the enthusiasm the girls showed in learning more about the link between PA and wellbeing. Follow up consultations showed slightly less engagement from some participants, but high levels of engagement from the majority of girls:

During the follow up consultations, a number of girls had reached the goals they had set. For several of those who had not achieved their goals, they showed an increased level of awareness in relation to why they had not achieved their goals and were positive about over-coming such barriers in the future. A limited number of pupils seemed less responsive to the consultations and appeared to be less interested in setting goals and discussing their PA as compared to the first consultation.

Overall, buy-in to the PA consultation component of the intervention was positive, with some girls showing less engagement during the follow up consultation.

Staff buy-in

Chapter 6 indicated that lack of involvement from the staff was a negative feature of the intervention. In the current intervention, the PA intervention was fully integrated into the curriculum for the full term and teachers were positive about the opportunity for girls to take part and assisted in the logistics of the intervention delivery:

The staff have been very supportive in relation to sourcing rooms and equipment and helping organise the girls for questionnaires and to class. Additionally, any behavioural issues within the active-gaming sessions have been dealt with by the staff and pupils have been advised to behave during sessions as they would during normal PE.

Whilst the teachers were supportive of the project, there was a mixed response in relation to the perceived effectiveness of the intervention:

The girls wanted choice, but during a discussion with one teacher, she remarked that: ‘too much choice is no choice’ However, an active schools co-ordinator who came to observe, remarked that some of the girls who quite often sit and do nothing in PE were at least on their feet and moving.

For one teacher, it was noted that she felt that for some girls it didn’t matter what they were offered, they would still not engage in PA in the school environment. However, in contrast, it was reported that some girls who are usually inactive during PE were taking part in active-gaming. Overall, there was support from the teachers in this school and it would have been difficult to conduct the intervention without their support. Importantly, even if they did not believe active-gaming was a suitable way to encourage PA, this did not deter their enthusiasm and support for the intervention and without this it would have been difficult to implement the intervention appropriately

Content and format of the physical activity consultation

The group format of the consultations seemed to be effective in allowing girls to discuss their PA preferences in a supportive environment:

Pupils seem to be working well in a group set-up. Although the workshops are possibly not as advantageous for the high active girls, they appear to be working well with and supporting lower active girls to suggest ways they can increase their activity levels. Consultations provide girls with a lot of opportunity to discuss health related issues - a lot of girls interested in finding out more about diet- hard to get through to them that PA is equally as important (i.e. “if you just eat right and aren’t active you’ll be fine”).

However, the researcher commented that it would perhaps be beneficial to have an individualised approach for the follow-up consultation, especially when girls have not reached their activity goals:

During follow up consultations girls surprised by what they didn’t manage to do, this is similar to the consultations in Study 1. Was hard to keep their attention during the second consultation - perhaps follow consultations should be individualised, this is maybe where you can be more specific, focus in on

individual problems...? Girls still seem to be responding positively to the workshops and appear to be enjoying them.

The researcher suggested that providing the opportunity for a one-to-one consultation when girls have not reached their PA goals may be appropriate. As with the active-gaming component of the intervention, there were some pupils who did not engage as well as others in the PA consultations:

I get the impression that quite a few girls enjoyed the consultations as they got out of class, but weren't really taking the information away and working on it which was disappointing. Others still working well in groups and responding well to the consultations.

As with the active-gaming component of the intervention, the majority of the pupils responded well to the PA consultation and the format and delivery seemed appropriate for the first consultation. It would perhaps be worthwhile offering a one-to-one consultation for pupils who are struggling to meet their PA goals.

Facilities and delivery

These notes refer to the facilities and delivery of the intervention for both components. The researcher noted that despite several trial runs, the initial set up of the active-gaming was difficult:

Set up was more difficult than anticipated; TV monitors stopped working and some wii controllers would not work either. However, girls still started the class either earlier or at the same time as their counterparts in traditional PE. As the intervention progressed, the classes were running smoothly with minimal technical problems (although still some).

Despite these technical glitches, it was important to note that the class were ready to start the activity as soon as they arrived.

In relation to the games on offer, it was apparent that some of the games appeared to require more exertion than others:

Some of the wii games appear particularly 'low active', Just Dance appears to be the most popular game and one that participants are very active during. Think wii fit plus is a good tool for those who only want to take part in light activity/walking or for those who don't have any friends present in the class. Some girls finding just dance tiring and moving from just dance down to Mario and Sonic or wii fit plus... Some girls reported being bored of the songs on just dance. Happy to try something different, but I didn't think that they were being particularly active with wii fit or wii sports resort. Wii fit running and boxing options were quite good.

The majority of girls were taking part in the more active games and were encouraged to do so. However, this highlights that 'active-gaming' as a general activity required consideration as different games may result in different levels of exertion. Further, girls reported becoming bored with the song / dance options available on Just Dance, possibly indicating that the novelty of this game wore off slightly as the weeks progressed.

Measurement and outcome

The researcher made a series of notes in relation to the measurement and outcome phases of the intervention. Several girls commented that they did not enjoy completing the follow up questionnaire:

In relation to the follow up, some girls were not happy about repeating the questionnaire and I am concerned this could potentially spoil their view of the project as a whole. However, participants were constantly reminded that the questionnaire was not something that was being evaluated at this stage.

In relation to the outcome, the researcher reflected that the intervention appeared to have some positive effects on a selection of the girls.

Several of the girls who had reported low levels of activity during the initial consultation and at the early stages of the intervention were feeding back that they were not only enjoying active-gaming as an option for PE, but were also more being more active at home. Some girls who had previously said they were too tired to be active for the whole of PE, were working hard for the duration of the session and appeared to be enjoying themselves.

7.7 Discussion

The current chapter considered previous relevant PA interventions along with the findings of preceding chapters in the current thesis to develop an active-gaming PA intervention underpinned by the SCT. The intervention targeted PA behavior and psycho-social correlates of PA and was supported by five key principles:

- To use PA consultations to enhance psycho-social correlates of PA including SE, self-regulatory SE and intrinsic motivation, with a focus on enhancing self regulatory skills such as self talk, and goal setting.
- To encourage PA participation both within and out with the school environment, through discussion, developing techniques to overcome barriers, seeking social support and introducing active-gaming as an enjoyable PA pursuit.
- To manipulate the environment to foster social support and a positive and supportive environment for PA during PE.
- To offer choice and ownership where possible.
- To ensure enough equipment and maximise the availability of basic provisions for the delivery of the intervention.

In line with these principles, the aim of the current study was to develop, implement and evaluate a SCT based active-gaming intervention with adolescent girls during school PE. Within this overall aim, the study had two sub-aims: Firstly, to evaluate the impact of the intervention on PA behavior and psycho-social variables associated with PA. Secondly, the study sought to examine the processes involved in the intervention through a pupil validity questionnaire and researcher case notes.

7.7.1 Section one: Overall physical activity and psycho-social variables of physical activity

Significant findings

Section 1 measured PA and psycho-social correlates of PA including stage of change, SE, social support, and intrinsic motivation, pre and post intervention between the experimental and control conditions exposed to the intervention for one school term (5 weeks).

Questionnaire analysis indicated that there was no significant difference in the stage of change score. This finding indicates that the current intervention was not successful at moving participants through stages of exercise change. This is contrary to study 1 which indicated that participants exposed to a PA consultation intervention were successful at progressing through stage of change post intervention. Differences between the study methodologies may account for this. In the current study PA consultations were only a component of the intervention compared to study one where they were the only manipulation. As well, traditionally, PA consultations are delivered to individuals identified as in the contemplation and preparation stage of change (Lowther et al., 1999) as was the case in Study One. In the current study however, participants were not selected in accordance to stage of change and it could be suggested that this limited the effectiveness of this component of the intervention. In support of this, the NICE (2008) review of PA interventions for adolescent girls suggested that stage-matched interventions tended to have positive effects on PA. Further, a traditional PA consultation is focused on individual consultations, whilst the current study delivered group based PA consultations. Although group based PA interventions have been with positive effects conducted (Mutrie, Campbell et al., 2007), this was with a clinical population. It is therefore suggested that future research examined the differences between group and individual based PA consultations in more detail.

There was no significant difference between the groups in relation to PA levels. These findings are surprising given that PA consultations were focused on helping participants to develop their PA and the active-gaming environment sought to encourage PA participants to be active both in and out of school. It is therefore unexpected that given the extra support those in the experimental condition received in comparison to the control group that there was no significant increase on this score.

There were no significant differences between the groups on changes in SE. However, given there was no increase in PA it is not surprising that there was no increase in SE; previous research has indicated that SE is a strong predictor of exercise adoption and maintenance (Miller, Trost & Brown, 2002; McAuley & Blissmer, 2000). Further, SCT based interventions which have employed techniques similar to those used in the current intervention have shown to be successful in increasing both PA and SE (Hortz & Petosa, 2006, Lubans and Sylva, 2006). The current study did not reflect the findings of these studies, but do go some way to supporting the relationship between SE and PA.

An increase in self-regulatory SE was anticipated given the use of goal-setting, strategic planning and self monitoring which was employed in order to aid participants in coping with barriers to exercise. However, given that there was no increase in PA, the lack of increase in self regulatory SE was also not surprising. Perhaps it would have been of use for the current intervention to examine self-regulation as opposed to self-regulatory self efficacy. Previous research (Anderson, Wojcik, Winett & Williams, 2006) measured self-regulation and their results indicated that there was a relationship between self-regulation and PA and was in fact the psycho-social variable with the strongest effect on PA. Further, Bandura's SCT model highlights the importance of self-regulatory abilities (Bandura, 1997) and thus, examining if the current intervention was successful in increasing self-regulatory skills would have been a worthy addition and it is suggested future research examines this in more detail.

Peer social support did not increase in the current study. This is also unexpected as PA consultations focused on developing social support for PA both in and out of school. Girls in the current school were already offered choice in relation to who they are active with in PE and perhaps this goes some way to explaining why an increase between groups was not evident; girls were perhaps already used to exercising with friends.

There was also no significant increase in family social support. It could be suggested that the intervention had aided participants in developing a more independent approach to PA or had support from alternative sources. However, it could be suggested that whilst the current intervention sought to encourage individuals to seek support from significant others, there was no specific involvement from parents in the intervention. Previous guidelines have suggested that parental involvement is paramount in PA interventions targeted towards this population (PAHA, 2010), however other research has indicated that perhaps peer support is more important during this period (Hohepa, Scragg, Schofield, Kolt & Schaff, 2007; Wold & Anderssen, 1992). Thus, additional research investigating the role of parental social support and PA in this population is encouraged.

Intrinsic motivation sub-scales included interest and enjoyment, effort and importance, perceived competence and perceived choice and there were no significant differences on any of the intrinsic motivation sub-scales. Given the current intervention was developed with careful considerations of the environment, these results were also unexpected. Choice was offered to participants both in the development phase of the intervention and

during each active-gaming session and consultation. However, it may be the case that participants in the current school believed they have a suitable element of choice already. In relation to 'interest and enjoyment' previous research has reported that active-gaming was enjoyed by participants (Hoyseneimi, 2006). Whilst girls in the current intervention did not lower their enjoyment score as a result of active-gaming, it appears that it was no more an enjoyable activity than other more traditional PE options. This is an important finding as it suggests that whilst active-gaming is an acceptable activity-choice for this population, it is not a panacea for inactivity, moreover active-gaming systems can be costly to implement and if pupils' enjoyment of PE is not significantly increased by the inclusion of active-gaming then the investment in such systems should be carefully considered.

No significant increase was observed on the sub-scale effort and importance. It was anticipated that educating girls about the importance of PA and the effort required to gain health benefits associated with PA might have led to an increase in this score. However, the intrinsic motivation questions were specific to PE, and it could be suggested that participants already view PE as important, as is suggested in the FFG review (Inchley et al. 2010).

There was no significant increase in the sub-scale perceived competence. It has previously been suggested that active-gaming might be a suitable activity for adolescent girls as it provides girls with an opportunity to 'fail' in a comfortable environment (Dixon et al., 2009). It may have been the case that given the sample included girls who were already active and thus competent in PE, examining the effects of active-gaming on girls with low levels of competence would be a suitable line of future enquiry.

Overall, an SCT based active-gaming intervention appears no more successful than traditional PE at increasing PA and psycho-social correlates of PA in adolescent girls. The lack of significant changes may be due to a number of reasons, many of which have been suggested above. Additional reasons may be as a result of the length of the intervention or that the control group were an active control group; different effects may have been evident in a sedentary control group.

Aim two

An additional aim of Section 1 was to examine the effects of the intervention on participants with differing PA levels. Given that the current intervention was a school PE based intervention, it was important to examine the effectiveness and feasibility of delivering the intervention across a variety of PA levels. However, previous research has indicated that ‘disengaged’ pupils may have different needs to pupils who are more involved in the PE process (Mitchell, 2010) so it was important to examine sub-populations according to PA level.

Results indicated that there was a significant difference between low active and high active participants on changes in PA levels from pre to post-intervention, although the effect size was small. Follow-up analysis indicated that low active participants significantly improved their PA levels from pre to post-intervention compared to high active participants in the intervention group. Further, additional analysis indicated that there was a significant difference between low active participants in the control group as compared to low active participants in the experimental group. This is an important finding as it suggests that this form of intervention is possibly better focused on girls with low levels of PA.

Additional significant differences were observed between low active and high active participants from pre to post-intervention on the intrinsic motivation subscale score of effort and importance, again with a small effect size. In relation to effort and importance it could be suggested that low active participants were more inclined to increase their effort and had realised the importance of PE as an opportunity to be active as a result of the intervention as compared to the high active girls who perhaps already recognised the importance of PA and put in the effort.

Low-active girls also increased their score on the sub-scale perceived competence, although it should be noted the effect size was also small. This is an interesting finding which suggests that whilst active-gaming does not perhaps engage girls who are already competent and active, active-gaming may be a suitable activity for girls with lower levels of competence in PE. Given that girls tend to assess their competence via internal and social sources, and that perceived competence is formed by information gathered from the environment and significant others (Fairclough, 2003), it could be suggested that the environment of the PE class for active-gaming helped developed an environment which

helped foster these feelings in low active-girls. Whilst the finding that the subscale of competence increased is encouraging, the sub-scale of interest and enjoyment is proposed as the primary self report measure of intrinsic motivation (Deci & Ryan, 2010) and there was no significant increase in this or perceived choice.

As was the case with the whole sample, there was no significant difference in changes in SE or self-regulatory SE between high and low active girls. This is contradictory to the finding related to competence, which indicated low active girls significantly increased in competence compared with high active. It could be suggested that an increase with competence was observed because participants had increased their competence within the specific PE domain (intrinsic motivation is not a global concept, but can vary dependent on the activity being carried out), whilst feelings of SE in achieving overall PA goals and in PA out with the active-gaming PE environment had not been transferred.

There were no significant differences on stage of change. Given that low active participants increased their PA score, it was surprising that there was not a significant move through stages of change. Previous research has indicated that where there is an increase in PA, this is reflected in an increase in stage of change (Kirk et al., 2004). It is suggested that further analysis with greater participant numbers, examining the influence of an intervention on low active participants would perhaps offer more insight into this relationship. Perhaps this is indicative of the small effect size for the PA interaction.

There was no significant difference pre and post intervention in either of the social support scales. As with aim one, social support was targeted in the PA consultations and it is surprising that an increase in social-support was not observed. Although pupils were encouraged to seek social support, it may be the case that those approached for support were not receptive. Including significant others in the intervention process may see an increase in social support and potentially in PA.

In summary it can be seen that the intervention had different effects for girls with different PA levels, specifically on PA and certain sub-scales of intrinsic motivation. Future research examining the effects of such an intervention on greater numbers of low-active participants is encouraged.

Aim three

The literature review indicated that interventions targeted at this population vary greatly in length, and there are no clear cut guidelines in relation to length of an intervention; interventions included in PA reviews range from a number of weeks to a number of years. Indeed the successful SCT school based interventions LEAP (Dishman et al., 2004) lasted two years, whilst Program X was a 10 week intervention (Lubans et al., 2009). Accordingly, the current intervention sought to examine the effects of the intervention on girls exposed to the intervention over differing time periods. Results indicated that there were no significant differences between participants in the 5-week and 10-week intervention on any of the variables. Given that effects were seen in low active participants after 5 weeks, it is suggested that this may be a suitable length of time in which to deliver such an intervention to low active girls. However, it could be suggested that changes across additional psycho-social measures which mediate PA behaviour and in more active-girls may require a longer intervention. Moreover, the current intervention did not provide a follow up and so the long term effects of the intervention are unknown.

Further, whilst low active participants increased competence in relation to PE, this increase in confidence was not transferred to a broader domain and indeed towards achieving PA recommendations for girls their age. So, whilst the initial increases in PA and increase in competence were important it could be suggested that a longer term intervention which was incorporated throughout the school year (over a series of months or years, rather than weeks) could lead to increased confidence in reaching PA goals and targets. For example, the two year LEAP programme saw an increase in PA in both the long and short term, and an association between psycho-social correlates of PA and levels of PA, suggesting this length of intervention may be necessary to see long term changes across a number of measures.

7.7.2 Section Two: Pupil validity and researcher case notes

The second key aim of the study was to examine participant experiences of the intervention through a pupil validity questionnaire and researcher case notes.

Pupil Validity Questionnaire

For the pupil validity questionnaire, results were organised in relation to the social validity concepts of; goals, procedures and outcomes. There was a mixture of positive and negative feedback, with the positive outweighing the negative. Some of the findings were

contradictory, highlighting the difficulty practitioners face when trying to meet the needs of adolescent girls (PAHA, 2010). Moreover, some of the findings of the qualitative analysis contradict the findings of the quantitative analysis. Findings are summarised and discussed in relation to previous literature and future research.

Goals

Negative

Negative feedback in relation to the goals of the intervention were that some pupils felt there was no point to the intervention and that for some they did not have appropriate input into the goals. Given the cross-sectional nature of the study, it is possible that for girls who were already active the goals of the intervention were not appropriate and in line with the quantitative findings, examination of sub-populations in isolation is encouraged.

Additional negative feedback was that some pupils thought it was not appropriate to focus on active-gaming in school as they can do so at home. The introduction of active-gaming was thought to be a useful tool for encouraging PA participation outside of school, but for some participants they would prefer to take part in an alternative activity to one they can do at home. Other pupils reported that they would rather have taken part in other forms of activity. Previous research has reported that 27% of school girls felt that PE in school would not be improved with a wider variety of activities (Inchley et al., 2010), and this is reflected in the current study with some pupils reporting they are content with the activities already on offer.

Positive

Although active-gaming was not viewed positively by all participants many girls did enjoy it as an activity, which is in line with previous research highlighting the potential of active-gaming as a suitable activity for adolescents (Dixon et al, 2009, Foley & Maddison, 2010).

In relation to PA consultations, pupils reported that they increased their knowledge in relation to PA and that they found this an acceptable goal. Previous research has indicated that only 19% of Scottish adolescent girls are aware of the PA recommendations for their age (Inchley et al., 2010) and the current study supports the notion that girls are interested in learning more about PA. The aim of increasing PA was also viewed favourably by

many girls, which is in line with previous research which highlighted that 84% of girls report that they would like to be more active (Inchley et al., 2010). Given that the sample was cross sectional, it is not surprising that the goals of increasing PA in and out of school and increasing PA knowledge was not a suitable goal for some girls. Nonetheless, the Likert responses indicate that the intervention goals were evidently still of interest to the majority and thus also some participants classed as 'high active'.

Likert responses indicated that for the majority of girls, the goals of the intervention were interesting, with more girls slightly more interested with increasing their overall PA as compared to PA during PE. This could mean that girls felt they were already active enough during PE, but felt they needed to increase PA out of school. This is in line with research which reports that 73% of girls in Scotland had taken part in one and a half hours or more of PE in the previous week and 81% report enjoying PE a little or a lot, as compared to only 47.5% who had taken part in extra-curricular activities. A key aim of the FFG study and a challenge for PA practitioners is providing suitable links between school and community PA and increasing participation both in and out of school (Inchley et al., 2010) and the finding reported in the current study supports this focus.

Procedure

Negative

With regard to the procedural aspects of the intervention, there were also a range of views, both positive and negative. Negative feedback associated with environmental aspects of the intervention indicated that some participants did not have enough friends present in the class with them. Given that all pupils were paired with at least two friends after the completion of the choice questionnaire this is surprising. It has been recognised both in this study and previous research that having friends in an exercise environment is important (DiLorenzo et al., 1998; Voorhees et al., 2005; Taylor et al., 1999) and this finding supports the inclusion of friends in the PA environment.

Some pupils reported that there was a lack of choice in the intervention. Choice has been highlighted as a key feature of exercise environments for this population (FFG, 2008; Hohepa et al., 2006) and enhancing choice was a key principle underpinning the PA intervention. It was therefore surprising that some pupils felt that there was a lack of choice. Nonetheless, as lack of choice was identified, by some, as a negative aspect of the intervention, this supports previous research which highlights the provision of choice

in PA environments in adolescent girls as important (Smith et al., 2009; FFG, 2008; Hohepa et al., 2006).

Negative feedback relating to the physical environment indicated that some pupils would have preferred more variety, which suggests that active-gaming alone is not enough to engage some pupils. This is reflected in the finding that some girls found active-gaming boring. It could be suggested that for participants who were 'high active' active gaming did not provide enough stimulation for them as more traditional sports. This is also in line with the views of some pupils who felt, that as an activity, active-gaming was not active enough. Some participants reported that they would prefer to take part in 'normal PE', not only because they did not particularly enjoy the activity, but also because they perceived that they would be more active during more traditional activities such as basketball and volleyball. Previous research has suggested that whilst active-gaming is a favourable alternative to sedentary gaming, individuals do not exert as much energy as in actual active pursuits (White, Kilding and Schofield, 2009; Unnithan et al., 2006).

In relation to the length of the sessions, some participants reported that they did not think 1 hour of wii was long enough. Further some pupils reported that they would have liked more than one session of active gaming a week. Whilst this is reported as a negative aspect of the intervention, it is encouraging that pupils would like to have experienced more of the activity. Examining the transference of active-gaming in school to active-gaming out of school and in the home might have been a useful avenue for investigation, given a large number of participants had access to an active-gaming system out of school. This again strengthens previous research which suggests girls in Scotland would like to be more active (Inchley et al., 2010).

Feedback in relation to the set-up of the activity indicated that pupils felt that the set-up time of the wii was too time consuming. Given that the researcher set up the class prior to the girls arrival in class, it is surprising that this feedback was received. However, it is acknowledged that there were technological glitches with active-gaming which would not have been experienced during more traditional PE activities. This is something to consider in the development of future interventions and for the implementation of active-gaming systems into the school environment.

The active-gaming sessions were delivered in a classroom which was not custom built for PA or active-gaming, consequently some pupils reported being rather cramped. Also in relation to the lay-out of the room, many TV monitors were positioned closer than ideal and as a result some pupils felt that it was difficult to hear the music associated with their programme. Previous chapters have identified that it is important to have the basic provisions and facilities for PA in place (Coalter & Dowers, 2006), If active-gaming was delivered in a spacious gym hall which had purpose built screens and wireless headsets then this may overcome this issue. This finding highlights that the physical environment may influence pupils experiences of PE.

Feedback relating to the negative procedural component of the workshops indicated that some pupils did not like that they had to miss class in order to attend the workshop. Girls in S4 in the current intervention were in the process of revising for their Standard Grade exams and reported missing revision periods for the consultation. For these girls, attending revision sessions was perceived as more important than attending a PA workshop. It has previously been highlighted that PA in this population competes with other activities (Biddle et al., 2005) and this findings supports the notion that PA is not always a priority for this group. For future interventions it is suggested that consultations are delivered in line with the curriculum, perhaps during PE or personal and social education in order to facilitate students and to engage the wider school community in PA.

Some pupils reported that they would have preferred more information to be available during the intervention, such as more ideas for PA and additional access to the researcher. Whilst this is perhaps a negative feature of the current intervention and something that could be improved in future work, it is encouraging that the girls were engaged to the extent that they would like more information and more exposure to the researcher. This again re-iterates that girls are enthusiastic about becoming more active and reflects the FFG findings (Inchley et al., 2010).

Positive

Whilst there were a number of negative factors which emerged in relation to the perceived negative features of the intervention, the quantity of positive feedback was far greater. Positive environmental features of the intervention identified that girls perceived the intervention as promoting a relaxed atmosphere, where by girls felt that they were not under pressure and were comfortable in the environment. Previous research has

highlighted that creating a class climate in which pupils are comfortable is important (Gibbons, 2009) and this is reiterated in the findings of the current intervention.

Providing an appropriate competitive balance within the PE environment can be challenging and creating the right motivational climate for exercise has been highlighted as important. Feedback from the current intervention indicated that participants enjoyed the option to introduce an element of competition into active-gaming if they so wished, but for many, competition was not important. .

It has been recommended that girls PA interventions are delivered in a situation where girls are with friends (Smith, 2009, FFG, 2008). A number of participants reported that a positive feature of the intervention was participating with friends which provides further support for this notion.

Pupils reported positively in relation to the personnel delivering the intervention, reporting that the researcher was helpful and encouraged people to feel comfortable in the environment. These characteristics, sometimes referred to as a socially enriched leadership style have previously reported as positive features of exercise leaders, and the current finding supports this. There are no known scales to measure the characteristics and behaviours of exercise leaders. Moreover, current PE teachers have only recently received additional guidance on how to work with adolescent girls (FFG, 2008). It could be suggested the development of an inventory or scale on which PA researchers can reflect upon their teaching practice would be a welcome addition.

In the current intervention, having a girls only class was viewed positively by some pupils and there was no suggestion that including boys into the environment would have improved the intervention. It has been suggested that PA interventions for adolescent girls are delivered in a girls only environment (PAHA, 2010) and this was followed in the current intervention. Although others suggest that as long as activities are tailored appropriately for girls, they need not be delivered in a single sex class (Gibbons, 2009), this was not supported in the current intervention.

Some participants reported that taking part in active-gaming in school encouraged them to do it more often at home and that it was a relatively easy activity to participate in outside of the school environment. Activities which promote life-long PA participation have been

suggested as appropriate for the target population (Gibbons, 2009) and this feedback suggests that active-gaming is an activity that can be replicated out of school. Quantitative findings indicate that this was not the case, but further examination of integrating the use of active-gaming systems in and out of school would be a welcome area of investigation.

Previous research has indicated that feedback in relation to the enjoyment active-gaming has mainly been positive (Liberman, 2006; Hoyseneiemi, 2006;). In the current intervention it was reported that some girls did not enjoy the activity, however a number of participants reported that they did enjoy the activity, and many participants reported that they enjoyed taking part in active-gaming as it was a relatively novel pursuit. It has previously been reported that active-gaming is a 'fun' activity, and this was reflected in the current study (Liberman, 2006; Hoyseneiemi, 2006;). Given guidelines that have suggested that PA targeted towards this population should have a focus on 'fun' and enjoyment, it would appear, that for many but not all girls, active-gaming is an appropriate activity.

The current study compared active-gaming as a PE option in comparison to more traditional PE options. It was reported by a number of pupils that they had a preference for active-gaming over 'normal PE'. Some pupils reported that before taking part in the intervention they had not previously enjoyed PE and other pupils reported that they worked harder during active-gaming sessions as compared to normal PE. However, these findings do not reflect those presented in the quantitative analysis whereby enjoyment did not increase and nor did PA. However, research examining if active-gaming is more appropriate for a sub-population (i.e. disengaged pupils) is welcomed.

In relation to the PA consultation workshops, pupils reported that they felt the strategies adopted (such as goal setting, a PA diary and self-talk) were appropriate. Feedback indicated that many participants viewed the workshops as 'good', pupils reported that it helped them to increase their knowledge and developing PA plans. There has been limited PA research examining the use of self-management strategies (which include goal setting, PA monitoring and self talk) although there is some support advocating their use with adolescents (Dishman, Motl, Sallis, Dunn, Birnbaum, Welk et al. 2005) and more recently self-management strategies were identified as a correlate of PA in males and females age 14-15 (Lubans & Morgan, 2007). Whilst this relationship was not examined in the current

thesis, qualitative feedback from pupils is supportive of such self-management strategies. Consequently it supports the suggestion by Lubans and Morgan, and the current thesis proposes that PE and school health promotion programmes are positioned to teach adolescents such skills. Furthermore, within the low active population, self-management strategies have been successful at increasing short-term PA in a pedometer study (Schofield, Mummery & Schofield, 2005).

As well as enjoying active-gaming due to the novelty factor, pupils reported enjoying the PA workshops because they were 'different'. Pupils have previously highlighted variety as an important feature of the exercise environment and it is suggested that the PA workshops offered this. However, given the intervention did not contain a follow-up, it is not clear whether this novelty factor may well have worn off if participants were exposed to more workshops over the course of a year.

Pupils reported that they found the enthusiastic approach of the researcher appropriate. Previous research has highlighted the importance of the relationship between the exercise practitioner and exerciser (Luke and Sinclair, 2001, Barr-Anderson et al., 2008) and it would appear that this relationship was perceived as influencing participants perception of the workshops.

Likert scale feedback indicated that the workshops were delivered in a manner which was appropriate. High scores were reported for understanding of the materials and examples that were suitable for the population, and most girls felt that they had enough exposure to the researcher. Despite the fact that pupils were in an environment with both their friends and individuals outside their friendship group, on the whole, pupils felt that they were grouped appropriately. This finding also suggests that participants were comfortable taking part in the PA interventions in a group setting, although this requires further examination as the intervention was not as successful in increasing PA or psycho-social correlates of PA as a one-to-one PA consultations employed in study 1 were. However, positive feedback relating to PA workshops suggests that these are a way of engaging this population.

Outcome

Negative

In relation to the outcome of the intervention, or whether or not the perceived degree of change was important to the individuals, both positive and negative feedback was received. Negative feedback indicated that some pupils felt that the project was of no benefit to them, but did not elaborate greatly on the reasons for this. Other pupils noted that the intervention was not useful for them as they felt that they were already active enough. Given that the current intervention was cross-sectional these findings are not surprising. This gives further support to the notion that future research focused on low active participants would be beneficial

Some pupils reported that it was difficult for them to evaluate the effect the intervention had on their levels of PA as they had no objective feedback. Several pupils reported that they would have liked to have known their PA levels pre and post intervention to measure the effect on them and one pupil suggested using pedometers to measure the change in PA more accurately. Whilst these improvements are acknowledged, it would have been difficult to implement them without influencing the results or adding an additional layer to the intervention. However, from a practitioner point of view it is encouraging that girls want to know more about their PA. Feedback is an important feature of intrinsic motivation (Mouratidis, Vansteenkiste & Lens, 2008; Whitehead & Corbin, 1997) and the consideration of internal and external feedback in future interventions is encouraged.

Positive

Positive feedback in relation to the goals of the intervention outweighed the negatives. Interestingly, despite the quantitative results in section one, pupils reported that they felt that they had increased their PA both in and out of school. Whilst this could raise questions about the measurement used to examine PA in the current intervention, these measures are validated for use with the current population. It is suggested that future research employs a more objective measure of PA in order to examine patterns of PA in more detail. It could be suggested that participants may have increased PA at certain times or during certain activities and this explains their perception that they had increased their PA, when in fact they had not. Examining patterns of PA behaviour would provide further insight into exactly what is happening. One very effective way of doing so is through the use of a PA diary which can track accelerometer data with diary excerpts (Atkin, et al., 2008).

Another key aim of the current study was to target SE. Again contrary to the quantitative findings, a number of pupils reported that the intervention helped them to increase their confidence and to 'feel better' about PA. The SE measurements used in the current intervention were specific to meeting the PA guidelines. It is suggested that whilst participants did not increase their SE in relation to meeting the PA guidelines, they perhaps increased their confidence and possibly SE in relation to certain aspects of PA.

Bandura's model of health promotion suggests that in order for individuals to enact positive health behaviour change they need to have the knowledge necessary to do so. Further, only 19% of Scottish adolescent girls are currently aware of the PA recommendations for girls their age (Inchley et al. 2010). Feedback from the participants in the current study was that the intervention assisted them in increasing both their knowledge and awareness in relation to PA and PA opportunities. It could be suggested that the girls increased their PA and this influenced their perception of becoming more active, despite PA questionnaire analysis indicating they had not. Although PA knowledge was not measured in the current intervention, qualitative feedback suggests that PA workshops are a suitable way to educate adolescent girls about PA.

The quantitative feedback from the Likert questions indicated that a large number of participants would recommend the teenactive project as an option for schools to help individuals increase their PA. This finding is encouraging as it is the first time a study has focused on the psycho-social influence of an active-gaming intervention focused on this population and it provides further justification for more research in this area.

The only mean score out of all the Likert questions to fall below a '5' out of '7' was in relation to using the information learnt in the project out of school. Key aims of the FFG study are to increase and improve opportunities for PA participation both in and out of school and to improve the links between school and community PA (Inchley et al., 2010). The finding in the current intervention suggests that the intervention employed did not achieve this link up. It is suggested that examining the influence of such an intervention with a wider-school approach and the inclusion of families and the community would be a positive area of investigation. This is in line with Sallis (Sallis et al., 1997) who recommended that further investigation in to programmes which promote the generalization of PA (not just within the PE environment) are required.

Researcher Case Notes

Researcher case notes were also used to examine participant experiences of the intervention and the feasibility of implementing the intervention from a researchers perspective. The attendance data demonstrated high adherence to the intervention, which provides further support that girls engaged in the intervention.

Whilst the pupil validity questionnaires were not divided according to participant PA level, case notes supported the quantitative findings and highlighted that less active participants responded more favourably to the intervention than their more active counterparts, providing further support for examining the effects of an SCT based active-gaming intervention on larger numbers of this sub-population. However, case-notes did highlight that active-gaming is not a panacea for all girls and some participants became disengaged throughout the intervention.

Teachers in the school in the current intervention were very important in supporting the implementation of the project. However, they were not otherwise involved in the intervention. Previous research has highlighted that school based interventions are most effective when a ‘whole school’ approach is employed. Moreover, increasing links with the wider community and increasing girls’ PA out of school is proposed as a priority (Inchley et al., 2010).

Finally, the researcher reported that girls fed back positive results relating to the intervention; that they were enjoying active-gaming and were increasing their PA both in and out of school. This follows pupil-validity feedback, but was not evident in the questionnaire analysis. It is difficult to know why this was the case, perhaps further examination with sub-samples of participants may yield further clarification.

7.8 Study Limitations

The research team aimed to implement research of the highest quality throughout the duration of the intervention. Nonetheless, as is commonplace in research, the study has its limitations. Whilst participant numbers were such that they were manageable for the current study, increased participant numbers would have lead to an increase in power. It has been noted that few studies conduct mediation analysis to identify whether increases in PA are a result of changes in theoretical constructs (Taymoori & Lubans, 2007). Accordingly, in the current thesis, increased participant numbers would have enabled mediation analysis multi-level modeling to have taken place, which could have examined

the relationship between psycho-social correlates of PA, PA behaviour and the intervention in greater detail.

The decisional balance score was removed from the data set as the data was not normally distributed. It has previously been suggested that the relationship between knowledge and attitudes about PA and the consequent behaviour was uncertain (Lubans & Morgan, 2007; Sallis, Prochaska & Taylor, 2000), but given that this was a key outcome measurement in the current study it is disappointing it could not be included in analysis.

The school in the current intervention was not randomly selected, which may have influenced results. There are several indications that participants in the current intervention were already receiving PE in an 'enriched' environment. Pupils reported being with friends, having choice and enjoying activities already on offer. The school was chosen for the intervention as teachers were willing, enthusiastic and co-operative. A school with a less favourable environment and less co-operative staff may have led to different findings and outcomes. Future investigations of sub-samples across a variety of schools is welcomed. The study also did not include a measurement of the environment and for this reason it was not possible to compare the environment in the intervention PE class compared to traditional PE. However, until some form of measurement of the PA environment is established this will be difficult to achieve.

As section one highlighted, the current study did not measure processes of change, self regulation or knowledge of PA. Consequently, it is difficult to tell if pupils developed these skills. The key outcome of the current intervention was to examine the influence of an SCT based active-gaming intervention on PA and psycho-social correlates of PA, and not to examine if the intervention succeeded in increasing self-regulatory and self-management skills. Nonetheless, future research focusing on this area is welcomed. Further it would have been worthwhile measuring PA knowledge pre and post intervention. The questionnaire had to be manageable for pupils and measuring any more than was done in the current intervention was not possible.

Examining the longer-term effects of the intervention on a sub-sample of low active girls would have been a worthy addition to the project as would the inclusion of a follow-up.

7.9 Conclusion

Findings in the current study reflect many of those previously presented in the preceding chapters and are in line with previous research which has consistently shown that adolescent girls respond well to an exercise environment which pays attention to wider psycho-social components. Indeed, in relation to positive changes in relation to both experiences and engagement, being provided with a choice of activity, being active with friends and invariably taking part in single sex classes were all highlighted as positive features of the FFG campaign (Mitchell, 2010) and are reflected in the current study. Although the current study did not seek to evaluate the SCT model used to underpin the intervention, these findings go some way to supporting the development of interventions which focus on all three aspects of Bandura's triadic reciprocal model of interaction: person, environment and behaviour. Interventions with an environmental component are in their infancy and as a result there are methodological issues surrounding the measurement of the environment and future research to examine this area is encouraged.

The intervention was successful in terms of participation and generally positive feedback relating to the nature of the intervention; however the intervention was not effective at increasing PA levels and correlates of PA compared with traditional PE in the whole sample. Nevertheless, there was evidence that low active girls did improve their PA levels more so than high active girls and showed enhanced scores on key correlates of PA indicating that this type of intervention may be best focused on low active girls. In relation to active gaming, it was a suitable PE option for many girls, but the challenge of transferring this activity to PA out of school was not achieved. It could be suggested that transferring PA from the PE environment to the wider environment is a major issue. For this reason, the current study welcomes the FFG key to aim to link between PE and the wider environment (Inchley et al., 2010).

The current study is promising in that girls appear to want to increase their PA and to increase their knowledge about PA, and this is also reflected in nationwide findings (Inchley et al, 2010). Given that pupils have previously reported that they want to do PA to be healthy and to feel better about themselves, as well as for fun, highlights that this 'hard to reach' population need as much investment out of school as they currently receive in school.

The current study designed, implemented and evaluated one of the first active-gaming intervention studies with a strong theoretical rationale, psychological focus and PA as a key measurement variable. Whilst key quantitative results did not indicate an increase in either PA or psycho-social correlates of PA with the current study design, further research focusing on low active girls would be of value to investigate the encouraging results with this sub-sample. Future research studying this group in isolation is encouraged. Qualitative results were encouraging and it is suggested that the opinions of participants are considered in the next phase of research and the development of future interventions in this area.

CHAPTER 8: CONCLUSIONS

The current action research study examined PA in adolescent girls from a SCT perspective and developed an active-gaming intervention based on this theory. The aim of the current chapter is to detail specific and general conclusions, to outline practical recommendations and highlight possible future research directions. It is suggested that the current study has made some new contributions to the Scottish adolescent girls PA literature.

8.1 Introduction

The detailed literature review conducted in Chapter 1 highlighted that low levels of PA is a major health concern in adolescent females in Scotland, thus suggesting that current practice for working with this group needs to be changed. Accordingly, the research sought to examine the way in which PA is currently delivered in state schools in Edinburgh. In particular, the thesis aimed to assess if active-gaming (delivered with appropriate environmental and personal support) is an appropriate means of developing PA and correlates of PA in the target population. Thus, the overall research aim was to design, implement and evaluate an SCT based active-gaming intervention on teenage girls in Edinburgh, Scotland.

In order to address this aim, it was important to ascertain what environmental and personal factors girls felt were important to their PA levels. Accordingly, three key studies were developed to aid the design of the intervention with the following aims:

1. To examine the effects of a PA consultation intervention on PA and personal correlates of PA.
2. To investigate social and physical environmental factors adolescent girls perceive as influencing their PA levels in PE.
3. To examine the role of active-gaming on PA in adolescent girls in a small scale project.

The results of these studies were used to inform Study 4 which aimed to develop, deliver and evaluate an SCT based active-gaming intervention for adolescent girls.

8.2 Specific conclusions

Study 1 highlighted that PA consultations may offer an acceptable and feasible means of targeting the inactivity issue in adolescent girls. The girls responded well to PA consultations suggesting that they enjoy talking one to one with an expert about PA and developing PA behaviour. However the results suggested that a PA consultation was not effective in increasing PA behaviour or psycho-social variables associated with PA behaviour, and future research would be valuable to investigate this issue further with a larger sample size so that issues of power are overcome.

Study 2 provided a unique insight into adolescent girls' perceptions of how the school environment influences PA behaviour. There is an increasing amount of literature focusing on the role of the environment on PA behaviour but there have been few studies that have adopted a qualitative methodology and focused specifically on this population. The findings can be used to inform schools how to best structure the environment to accommodate the specific needs of this population.

Results from Study 3 indicated that active-gaming was an acceptable activity for adolescent girls and may offer an alternative to traditional PE. However, it was evident that the nature of the activity itself would not be sufficient to lead to increases in PA and any future implementation would need to consider the psycho-social environment (e.g., leadership style, attitudes of participants) within which the activity is integrated.

Study 4 incorporated the findings of the previous studies to develop an active-gaming intervention that addressed the individual and environmental factors deemed to be relevant to increasing PA behaviour. Although participation in the intervention was good and the girls provided generally positive feedback relating to the nature of the intervention, the intervention was not effective at increasing PA levels and correlates of PA compared with traditional PE in the whole sample. Overall, the findings suggest that active-gaming is not an effective approach to increasing PA in the 'hard-to-reach' group of adolescent girls. Nevertheless, there was evidence that low active girls did improve their PA levels more so than high active girls and showed enhanced scores on key correlates of PA, indicating that this type of intervention may be best focused on low active girls. Further research focusing on low active girls would be of value to investigate the encouraging results with this sub-sample.

8.3 General conclusions

PA behaviour is complex and a number of factors are influential in changing this behaviour. The current thesis has focused in detail on the PA behaviour of adolescent girls and increased understanding of the influence of individual and environmental factors on PA behaviour. The thesis has demonstrated that the implementation of PA interventions is feasible within a school setting and adolescent girls are open and favourable to PA interventions, especially when they focus on an individual's needs. Active-gaming is a popular activity with adolescent girls, however an active-gaming intervention may only be effective at increasing the PA levels of low active girls, and may not influence the PA levels of girls who were already active.

8.4 Importance to stakeholders and possible implementation

The current study was funded by the Chief Scientist's Office given the relevance of PA to the NHS. This relationship has been recognised in recent policy developments including the Health Plan for Scotland, the NHS Plan, and the National Service Frameworks for the NHS (Health Development Agency, 2005). Further, the Chief Medical Officer noted that *'there are few public health initiatives that have greater potential for improving health and well-being than increasing the activity levels of the population'* (Department of Health, 2004, p. 20). However, it is anticipated that emergent findings in the current thesis also bear relevance for additional stakeholders, such as Learning Teaching Scotland, the Department of Education, PE teachers and teacher trainers (i.e. Her Majesties Inspectorate) as well as for other research groups. From the findings of this thesis, several key points that are important to these stakeholders can be made relating to understanding and increasing PA in adolescent girls and it is likely that these points have relevance to the broader population and these are now outlined.

With regards to PA consultations, it is suggested that PA interventions incorporating PA consultations are received favourably and offer a promising avenue for health promotion. Pupils appeared engaged in the process and enjoyed discussion health issues with a professional. Assessing the cost effectiveness and the feasibility of implementing such interventions within the Curriculum for Excellence is of particular importance, in particular under the remit of health and wellbeing. Further, consideration as to who is in the best place to deliver such consultations to at risk individuals is worthy of additional consideration as it may not be feasible for PE teachers to do so under their current remit. School counselors are common place in many American and International schools and the

current thesis proposes that further investigation of the implementation of such roles into Scottish schools would be welcomed.

The second study reinforced the view that PA behaviour is influenced by both environmental and individual factors and health professionals should have a broad understanding of the determinants of PA. Chapter 5 in the current thesis provides some of the only known research which has focused on the specifics of the school environment and more rigid testing of some of the themes which emerged in this study are encouraged. In turn, it is suggested that the development of an environmental inventory for PE would be an effective tool for monitoring the environment in which PE is being delivered in schools.

Chapter 5 also highlighted several key characteristics and behaviours of PE teachers as identified by adolescent girls. Through reflection on these findings and discussion with stakeholders, it would appear that PE departments are currently neither trained nor equipped to address the problem of inactivity in adolescent girls, but are often tasked with this job. The findings of this thesis highlight that adolescent girls relate to certain leadership approaches and this information could be used to inform teacher training, perhaps in line with the current FFG initiative. Moreover, it is suggested that the findings of the current thesis are used as a basis on which a ‘characteristics and behaviors’ inventory could be developed. Such an inventory could potentially contribute to both teacher training and for teacher assessments; however more rigid examination of the emergent themes is suggested as a first step in this process.

The findings in the final two studies presented in the current thesis suggest that active-gaming is a popular activity that is generally well received. Preliminary results relating to increasing PA in low active girls are promising and further research in this area is encouraged. More specifically, examination of active-gaming as a means to displace sedentary activity within this population would be a valuable avenue of research, as would the role of active-gaming on developing flexibility and co-ordination amongst this group. Despite the promising findings and potential promising areas of future research, it is suggested that active-gaming does not provide a panacea for increasing PA in adolescent girls. Thus it is suggested that the cost implications of delivering such interventions in a school environment and elsewhere require careful consideration before schools invest further in such technology.

8.5 The research experience

Consistent with action research, it was deemed appropriate to provide a brief reflection on the research process. The research experience has been one of enjoyment coupled with numerous challenges. An early research reflection was that research can be unpredictable and can sometimes lead to feelings of frustration and disillusion. However, through discussion with my supervisors, research colleagues and appropriate reading, I developed my adaptability and flexibility, and became more accepting of the changeable nature of research.

This thesis has allowed me to employ a number of forms of enquiry, and a variety of research methods. Accordingly, this has enabled me to welcome and challenge theoretical stances associated with both qualitative and quantitative forms of enquiry.

My PhD has enabled me to develop into a confident and independent researcher. Over a four year period I have grown in confidence relating to my research directions and decisions. Further, my ability to critically appraise my reporting style has enhanced greatly. The action research approach of my thesis has been invaluable for reflecting on the applied impact of my research and thus enabling me to establish where my research interests could be effective in the applied world. Moreover, combining the research experience alongside the role of a sport and exercise practitioner role has allowed me to enjoy the ‘best of both worlds’ in recent years. Whilst still undecided as to where my preference in relation to either research or practice lies, I hope my academic journey will continue in the positive light in which it has started.